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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

November 1998

Data Assimilation
Meteorological Office
London Rd
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Berkshire
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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-14. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

N.B. 500 km SATEMs are no longer assimilated into the UKMO global Unified Model. Both 500 km and 120 km SATEMs were replaced on 16th April 1996 by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS (from NOAA-11 and NOAA-14).

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

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Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
6. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
7. January 1998. Increase in resolution of UKMO global forecast model.
8. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
9. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
10. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
11. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
12. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.| bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
2.SD	≥ 6 hPa	(pressure),
	> 80 degrees	(direction).
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
C6QF6	ALL	P	SUR	28	0	0	1.7	-4.6	4.9
ELRT5	ALL	P	SUR	39	18	46	5.4	11.9	13.1
ELTP9	ALL	P	SUR	44	0	0	0.9	4.2	4.3
ELTX5	ALL	P	SUR	62	1	2	1.0	6.5	6.6
FHZI	ALL	P	SUR	20	0	0	2.7	-4.7	5.4
OVLP	ALL	P	SUR	34	12	35	1.2	1.5	1.9
PDHO	ALL	P	SUR	30	0	0	0.9	-4.1	4.2
S6JP	ALL	P	SUR	24	0	0	4.9	5.0	6.9
UCMR	ALL	P	SUR	28	15	54	5.1	1.4	5.3
UCTP	ALL	P	SUR	25	0	0	2.9	4.4	5.3
UDTH	ALL	P	SUR	47	1	2	2.1	-4.1	4.6
UICO	ALL	P	SUR	49	3	6	1.6	-10.3	10.4
UITJ	ALL	P	SUR	26	0	0	1.0	-11.3	11.4
VCJM	ALL	P	SUR	21	21	100	0.0	0.0	0.0
VCTV	ALL	P	SUR	30	8	27	5.3	3.3	6.3
VGKM	ALL	P	SUR	20	16	80	4.5	-6.4	7.9
WCV7620	ALL	P	SUR	20	0	0	1.5	4.8	5.0
WDZB	ALL	P	SUR	27	0	0	2.1	-5.6	6.0
WQZ9670	ALL	P	SUR	64	1	2	1.9	-5.2	5.6
XLW363	ALL	P	SUR	21	10	48	4.2	-1.0	4.3
ZCBF6	ALL	P	SUR	62	1	2	2.8	5.0	5.8
3FGQ3	ALL	P	SUR	69	0	0	1.6	8.8	8.9
3FOW4	ALL	P	SUR	54	0	0	1.1	4.5	4.6
3FPB6	ALL	P	SUR	35	0	0	1.4	-4.6	4.8
62167	ALL	P	SUR	82	1	1	1.1	-4.8	4.9
9MCM	ALL	P	SUR	51	0	0	1.1	4.3	4.4
WIND SPEED									
C6JE5	ALL	SPEED	SUR	66	0	0	2.2	-5.0	5.5
C6KE3	ALL	SPEED	SUR	28	8	29	2.8	-2.6	3.9
C6LQ3	ALL	SPEED	SUR	32	0	0	6.0	5.3	8.0
C6NI3	ALL	SPEED	SUR	27	1	4	6.6	6.0	8.9
C6TX	ALL	SPEED	SUR	21	0	0	2.5	6.7	7.1
DATG	ALL	SPEED	SUR	38	1	3	4.7	8.4	9.7
DUQM	ALL	SPEED	SUR	57	3	5	6.3	7.2	9.6
ELGG3	ALL	SPEED	SUR	29	1	3	10.0	8.4	13.0
ELNK8	ALL	SPEED	SUR	36	0	0	4.5	8.7	9.8
FNJI	ALL	SPEED	SUR	119	3	3	6.4	6.0	8.8
FNRV	ALL	SPEED	SUR	32	0	0	6.2	5.9	8.6
FNZP	ALL	SPEED	SUR	103	1	1	5.8	8.6	10.3
HPEW	ALL	SPEED	SUR	24	0	0	2.5	7.0	7.4
LAWO2	ALL	SPEED	SUR	26	0	0	7.1	6.9	10.0
OUEK	ALL	SPEED	SUR	70	5	7	8.3	7.0	10.8
PCCZ	ALL	SPEED	SUR	35	0	0	6.1	7.0	9.3
PGDP	ALL	SPEED	SUR	53	0	0	6.2	5.5	8.3
PJOX	ALL	SPEED	SUR	55	0	0	5.7	6.1	8.3
SYMK	ALL	SPEED	SUR	45	0	0	2.7	6.9	7.4
VRUY4	ALL	SPEED	SUR	49	0	0	1.4	5.7	5.9
3FDO6	ALL	SPEED	SUR	49	31	63	10.9	-6.6	12.8
9MBK8	ALL	SPEED	SUR	24	0	0	6.0	6.7	9.0
9MUG	ALL	SPEED	SUR	46	1	2	5.5	6.6	8.6
9VMY	ALL	SPEED	SUR	29	1	3	7.7	9.6	12.3
9VVU	ALL	SPEED	SUR	20	0	0	4.0	-7.5	8.5
WIND DIRECTION									
UCMR	ALL	DIRN.	SUR	25	0	0	76.8	-52.2	92.9
ZCBN9	ALL	DIRN.	SUR	34	0	0	66.9	37.1	76.5
3FDO6	ALL	DIRN.	SUR	37	31	84	18.1	75.1	77.2
3FFF8	ALL	DIRN.	SUR	20	0	0	81.4	24.1	84.9
46053	ALL	DIRN.	SUR	25	0	0	17.7	-43.1	46.5
46181	ALL	DIRN.	SUR	103	0	0	20.8	-39.9	45.0
47023	ALL	DIRN.	SUR	35	0	0	27.0	-34.5	43.8

AVAILABILITY – SHIP/SYNOP – NOVEMBER 1998

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 21001

FIGURE 1

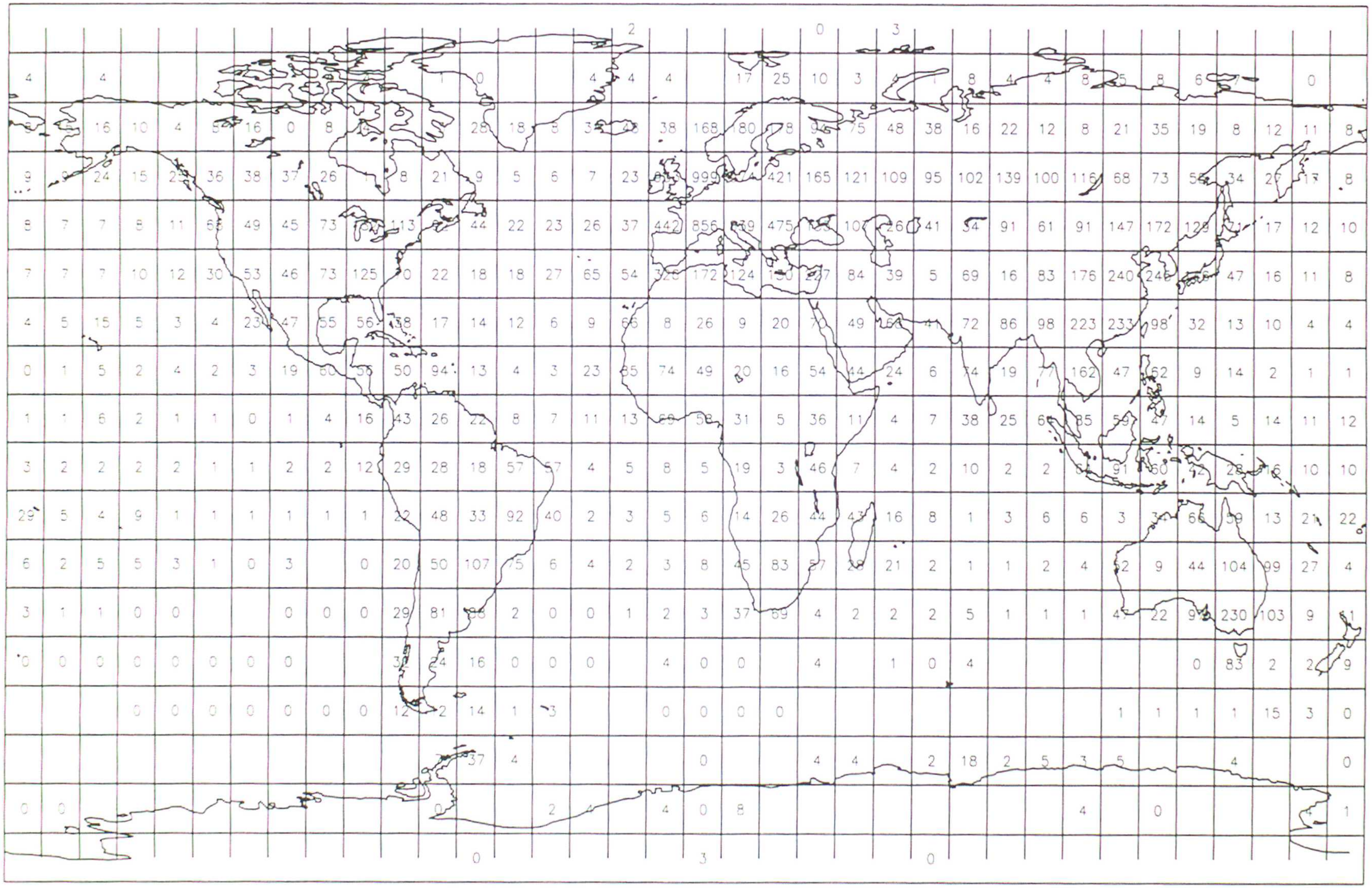


TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures			
Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for drifting buoys.	
Standard of comparison		:Background field from Bracknell global model.	
Position		:Average latitude and longitude for period.	
Observation times		:00, 06, 12, 18 UTC	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees).	
Parameters monitored			
	:NOBS	:Number of observations received excluding duplicates.	
	:NGE	:Number of observations with gross errors.	
	:PGE	:Percentage of observations with gross errors.	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa :25 m s^{-1}	(pressure) (vector wind)	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.| bias|	≥ 4 hPa ≥ 5 m s^{-1} > 30 degrees	(pressure), (wind speed), (direction).
	2.SD	> 6 hPa ≥ 80 degrees	(pressure), (direction).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
21627	37.7	129.1	ALL	P	SUR	58	0	0	1.2	-9.2	9.2
33503	44.7	-64.1	ALL	P	SUR	58	0	0	2.4	-4.6	5.2
46624	34.3	-138.9	ALL	P	SUR	30	0	0	1.1	-5.4	5.5
46922	27.3	-137.6	ALL	P	SUR	82	0	0	2.0	4.4	4.9
47601	72.2	-133.7	ALL	P	SUR	354	126	36	6.0	1.2	6.2
WIND SPEED											
21531	36.2	-168.4	ALL	SPEED	SUR	476	0	0	3.0	-5.2	6.1
39811	15.7	-146.8	ALL	SPEED	SUR	32	0	0	8.1	5.0	9.5
44773	57.1	-7.4	ALL	SPEED	SUR	45	0	0	3.2	-6.8	7.5
WIND DIRECTION											
12506	18.9	38.1	ALL	DIRN.	SUR	48	0	0	34.5	-88.9	95.4
21531	36.2	-168.4	ALL	DIRN.	SUR	63	0	0	13.8	-37.3	39.8
44773	57.1	-7.4	ALL	DIRN.	SUR	31	0	0	49.4	100.6	112.0
46535	38.0	-131.6	ALL	DIRN.	SUR	573	0	0	55.7	71.1	90.3
46560	41.8	-136.4	ALL	DIRN.	SUR	628	0	0	42.0	-84.6	94.4
46562	43.4	-134.0	ALL	DIRN.	SUR	104	0	0	84.5	67.3	108.0
52540	13.4	144.7	ALL	DIRN.	SUR	187	0	0	21.5	76.3	79.2
55587	-40.8	163.0	ALL	DIRN.	SUR	406	0	0	19.8	30.1	36.0
61524	41.9	17.8	ALL	DIRN.	SUR	34	0	0	69.0	-118.6	137.2

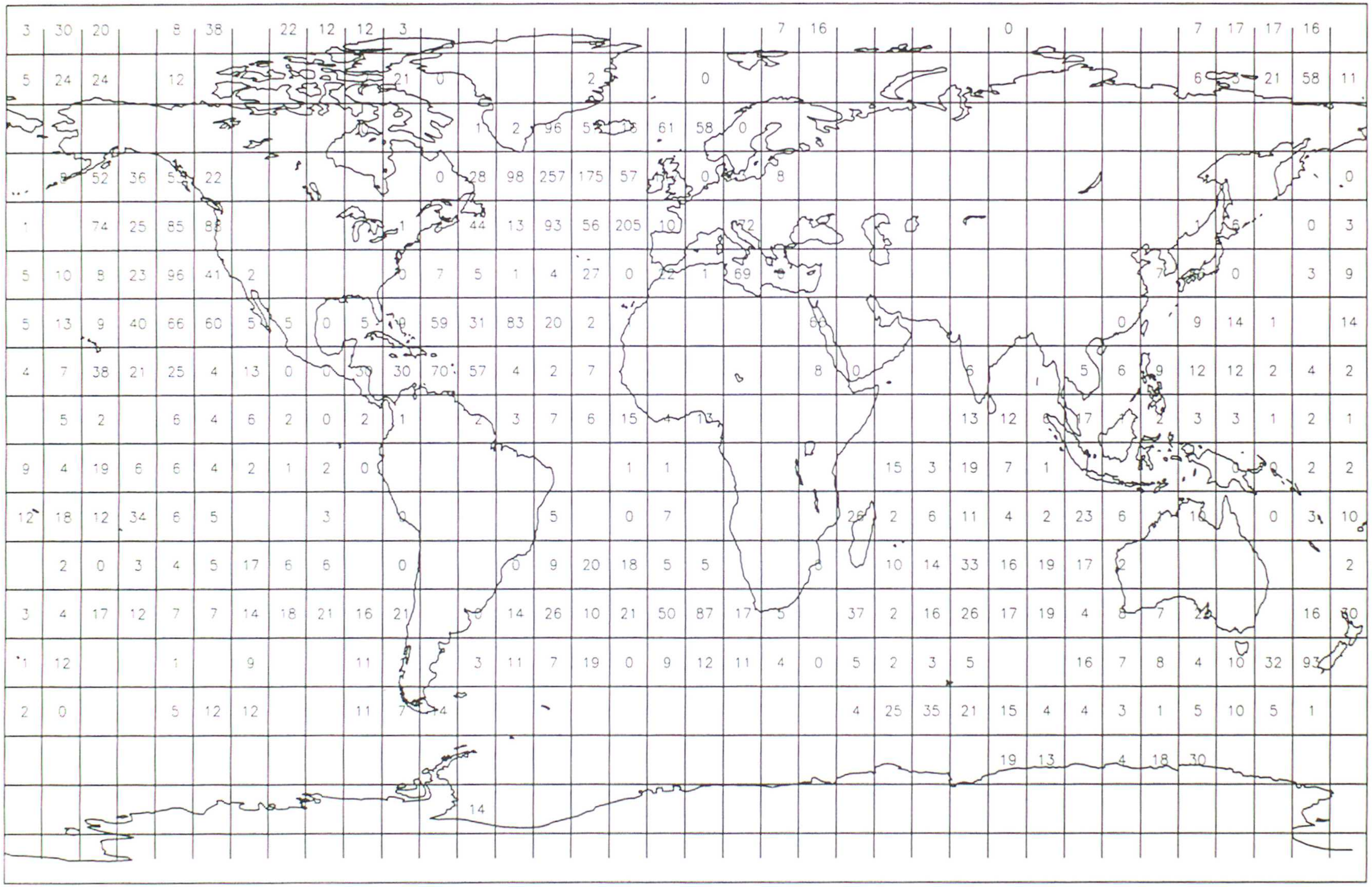
AVAILABILITY – DRIFTER – NOVEMBER 1998

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 5668

FIGURE 2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5 24 24 12 21 0 2 0 6 21 58 11
1 2 96 61 58 0
52 36 22 0 28 98 257 175 57 0 8 0
1 74 25 85 88 1 44 13 93 56 205 10 72 1 6 0 3
5 10 8 23 96 41 2 0 7 5 1 4 27 0 22 1 69 7 0 3 9
5 13 9 40 66 60 5 5 0 5 59 31 83 20 2 66 0 9 14 1 14
4 7 38 21 25 4 13 0 0 30 30 70 57 4 2 7 8 0 6 5 6 9 12 12 2 4 2
5 2 6 4 6 2 0 2 1 2 3 7 6 15 4 13 13 12 6 17 7 2 3 3 1 2 1
9 4 19 6 6 4 2 1 2 0 1 1 15 3 19 7 1 0 2 2
12 18 12 34 6 5 3 0 5 0 7 26 2 6 11 4 2 23 6 16 0 3 10
2 0 3 4 5 17 6 6 0 0 9 20 18 5 5 5 10 14 33 16 19 17 2 2
3 4 17 12 7 7 14 18 21 16 21 0 14 26 10 21 50 87 17 5 37 2 16 26 17 19 4 8 7 22 16 30
1 12 1 9 11 3 11 7 19 0 9 12 11 4 0 5 2 3 5 16 7 8 4 10 32 93
2 0 5 12 12 11 7 14 4 25 35 21 15 4 4 3 1 5 10 5 1
19 13 4 18 30
14

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.| bias|	> 4 hPa
	2. SD	> 6 hPa
	3.PGE	> 25.

N.B. For stn ht > 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	113	0	0	0	0.7	4.6	4.7
60468	35.6N	6.2E	1052	S8	83	83	100	0	0.0	0.0	0.0
60511	35.3N	1.4E	1127	S8	110	90	82	0	0.4	14.4	14.4
60535	34.7N	3.3E	1144	S8	84	1	1	2	1.5	-6.4	6.6
60571	31.6N	2.2W	773	S8	118	1	1	0	0.7	-4.0	4.1
60670	24.6N	9.5E	1054	S8	112	1	1	2	1.2	9.3	9.4
63330	13.5N	39.5E	2070	MS	41	41	100	0	0.0	0.0	0.0
63333	11.1N	39.7E	1903	MS	41	0	0	29	0.9	4.1	4.2
63334	10.3N	37.7E	2515	MS	50	0	0	0	0.8	10.7	10.7
63402	7.7N	36.8E	1725	MS	44	0	0	2	2.8	7.2	7.7
63450	9.0N	38.8E	2354	MS	79	0	0	0	0.6	5.3	5.3
63471	9.6N	41.9E	1260	MS	61	2	3	0	0.9	10.8	10.8
63478	5.9N	43.6E	295	MS	37	0	0	0	1.0	7.2	7.3
63602	3.1N	30.9E	1204	S	35	35	100	97	0.0	0.0	0.0
63661	1.0N	35.0E	1890	8	102	1	1	0	0.9	4.2	4.3
68343	27.6S	25.6E	1228	S8	106	0	0	100	1.1	-8.9	9.0
68396	26.5S	31.3E	641	S8	52	0	0	0	1.0	4.4	4.5
69679	43.9N	18.3E	1557	M	40	40	100	0	0.0	0.0	0.0

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24671	63.9N	135.9E	402	MS	114	0	0	59	3.2	8.1	8.7
24688	63.3N	143.2E	741	MS	115	6	5	37	5.6	5.1	7.6
25621	64.0N	158.9E	683	MS	114	0	0	35	4.4	5.0	6.7
30253	57.9N	114.2E	275	MS	119	0	0	8	2.6	4.2	4.9
30320	56.9N	105.7E	669	MS	115	56	49	0	1.4	1.7	2.2
30554	54.5N	113.6E	995	MS	119	0	0	50	3.9	5.7	6.9
30664	53.5N	115.6E	811	MS	25	0	0	0	1.7	-4.2	4.5
31123	57.8N	130.9E	255	MS	58	0	0	19	2.5	4.6	5.2
31474	51.6N	133.3E	384	MS	113	0	0	49	3.0	5.0	5.8
40743	36.2N	57.7E	941	MS	106	2	2	1	1.7	-4.7	5.0
40762	35.3N	59.2E	1333	MS	104	11	11	1	2.5	-13.1	13.3
41254	23.1N	57.7E	1755	S8	87	87	100	0	0.0	0.0	0.0
41396	16.0N	48.9E	700	MS	24	0	0	46	2.7	7.0	7.5
41535	34.2N	73.3E	1308	8	59	0	0	3	2.1	-5.6	6.0
44239	48.8N	103.6E	1209	MS	113	0	0	1	1.8	-4.4	4.8
44256	49.6N	114.4E	706	M	107	3	3	18	2.6	-4.0	4.8
44416	28.6N	81.6E	720	MS	67	2	3	3	2.1	4.9	5.3
44477	27.0N	87.4E	1445	S8	64	64	100	0	0.0	0.0	0.0
51334	44.6N	82.9E	321	M	120	0	0	35	3.2	5.1	6.0
51379	44.0N	89.6E	794	M	120	0	0	20	2.3	4.9	5.4
51818	37.6N	78.3E	1376	M	120	0	0	13	2.2	4.8	5.3
52602	38.8N	93.4E	2734	S	120	0	0	0	0.9	-6.2	6.3
52866	36.6N	101.8E	2262	S	120	0	0	0	0.8	-4.6	4.7
53083	44.6N	114.2E	1183	M	120	0	0	48	2.3	4.5	5.1
53352	41.7N	110.4E	1377	M	120	0	0	43	2.2	5.4	5.8
53480	41.0N	113.1E	1416	M	120	0	0	23	2.2	4.5	5.0
53502	39.8N	105.8E	1033	M	120	1	1	21	1.9	4.0	4.4
53588	39.0N	113.5E	2898	S	120	120	100	0	0.0	0.0	0.0
54386	41.4N	128.2E	1018	M	119	1	1	33	2.6	4.7	5.4
54587	39.1N	123.2E	-23	M	101	0	0	2	1.9	-4.8	5.2
56021	34.1N	95.8E	4176	S	120	0	0	0	0.8	-5.0	5.1
56144	31.8N	98.6E	3184	S	94	3	3	0	1.2	-5.9	6.0
56385	29.5N	103.3E	3049	S	120	0	0	8	2.5	-6.6	7.1
56444	28.5N	98.9E	3488	S	120	35	29	10	0.5	14.0	14.0
56462	29.0N	101.5E	2994	S	119	0	0	1	1.5	8.6	8.7
56954	22.6N	99.9E	1054	M	120	0	0	2	1.7	5.0	5.3
57006	34.6N	105.8E	1143	M	120	0	0	3	1.4	4.9	5.1

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	42	0	0	0	1.3	-5.2	5.4
82326	3.8S	62.1W	48	MS	65	0	0	34	1.6	5.0	5.2
82704	7.6S	72.7W	170	MS	56	0	0	0	1.3	-4.4	4.6
83186	11.2S	40.5W	485	MS	67	0	0	40	1.9	-4.2	4.6
83214	10.3S	54.9W	285	MS	41	0	0	5	2.0	-5.6	5.9
83235	12.4S	46.4W	604	MS	67	0	0	3	1.9	6.2	6.5
83319	14.7S	52.4W	315	MS	51	0	0	0	0.9	-5.1	5.2
83332	14.1S	46.4W	826	MS	67	15	22	4	1.9	13.2	13.3
83408	14.3S	43.8W	447	MS	64	0	0	2	1.6	10.1	10.2
83423	16.7S	49.3W	741	MS	67	1	1	0	0.9	-5.9	6.0
83488	17.8S	42.9W	1097	MS	66	66	100	0	0.0	0.0	0.0
83531	18.6S	46.5W	940	MS	61	1	2	0	1.1	-7.3	7.4
83587	19.9S	43.9W	850	MS	66	0	0	0	1.0	-7.8	7.9
83773	23.1S	48.9W	793	S	34	0	0	0	1.2	-6.5	6.6
83836	25.5S	50.6W	837	MS	65	0	0	62	1.0	-4.0	4.1
84401	5.2S	80.6W	49	MS	72	0	0	1	1.7	5.9	6.1
84455	6.5S	76.4W	281	MS	66	0	0	0	1.8	5.0	5.3
84472	7.1S	78.5W	2620	S	35	0	0	0	0.7	-6.1	6.1
84501	8.1S	79.0W	26	MS	70	0	0	0	0.8	4.1	4.2
84542	9.4S	77.6W	2750	S	28	0	0	0	1.2	4.0	4.2
84686	13.6S	72.0W	3248	S	69	0	0	0	1.2	-7.9	8.0
84735	15.5S	70.2W	3826	S	45	0	0	0	0.8	-5.0	5.1
84782	18.1S	70.3W	468	MS	76	0	0	0	1.5	7.4	7.6
85312	19.8S	63.9W	992	S	35	34	97	54	0.0	-14.5	14.5
85406	18.3S	70.3W	55	M	116	0	0	0	1.1	5.0	5.1

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
70267	64.0N	145.7W	391	MS	108	0	0	2	1.7	4.0	4.3
70271	62.2N	145.5W	481	MS	83	1	1	40	2.6	5.3	5.9
72376	36.8N	108.2W	1677	M	109	0	0	33	3.3	5.2	6.2
76118	30.4N	109.7W	1040	MS	27	0	0	0	0.9	-10.2	10.2
76625	20.6N	100.4W	1813	MS	39	0	0	0	0.8	-6.9	6.9
76632	20.1N	98.7W	2417	MS	20	0	0	0	0.7	-5.6	5.6
76658	19.2N	103.7W	494	MS	44	0	0	0	0.9	6.9	7.0
76698	19.6N	88.0W	20	MS	70	0	0	3	1.2	-4.4	4.6
76775	17.1N	96.7W	1550	MS	34	0	0	0	0.9	4.6	4.7
76845	16.7N	92.6W	2276	MS	87	87	100	0	0.0	0.0	0.0
78718	14.4N	87.6W	626	MS	47	34	72	0	0.6	-14.0	14.0
78745	12.0N	86.8W	5	MS	22	0	0	0	1.0	-6.5	6.6

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94328	22.4S	133.6E	623	M	21	0	0	0	1.0	6.3	6.4
94955	41.6S	145.7E	684	MS	112	112	100	0	0.0	0.0	0.0
95952	41.9S	145.6E	560	MS	111	111	100	0	0.0	0.0	0.0

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
02045	67.8N	20.4E	408	M	108	108	100	0	0.0	0.0	0.0
11146	47.1N	13.0E	3105	S7	84	1	1	17	1.8	-4.5	4.8
11180	47.7N	15.8E	1546	S8	104	0	0	5	1.3	-4.5	4.7
12510	50.7N	15.7E	1603	S8	117	0	0	75	1.9	-4.0	4.4
15280	45.4N	25.4E	2504	S	116	0	0	93	1.5	-4.6	4.8
16227	41.9N	13.6E	655	M	44	44	100	0	0.0	0.0	0.0
16614	40.4N	21.3E	604	MS	95	0	0	0	0.9	-6.1	6.2
17092	39.8N	39.5E	1218	S8	115	0	0	0	1.1	7.8	7.9
17203	38.9N	40.5E	1177	S8	110	0	0	0	0.9	5.2	5.3

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89264	71.4S	68.9W	780	S	241	0	0	0	2.5	6.5	7.0
89345	81.7S	148.8W	620	S	385	59	15	14	3.3	-7.6	8.3

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	99	2	23	1.6	0.7	98	0	22	0	8.4	1.2
AAH	56	7	25	1.4	0.1	52	0	19	0	8.9	2.0
AAL	5089	0	24	1.7	0.0	4756	0	21	0	8.6	1.0
AAR	1143	0	6	2.0	-0.4	1146	1	7	0	9.0	0.6
ACA	1623	0	6	2.0	-0.2	1602	0	4	0	7.8	0.6
ACI	47	0	43	1.2	0.6	49	0	45	0	8.9	1.4
AEA	514	1	20	2.4	1.1	467	0	15	0	9.0	1.0
AEL	703	1	16	1.6	-0.4	703	1	16	0	9.9	0.9
AEY	122	1	5	1.4	0.3	121	0	4	0	7.6	1.2
AFL	448	1	6	2.2	0.7	446	1	5	0	8.3	0.7
AFR	2000	0	12	1.8	0.1	2020	0	12	0	9.1	0.8
AIH	204	1	9	1.8	0.2	198	1	8	0	9.6	0.9
AJM	105	2	6	1.1	-0.5	105	0	4	0	8.4	1.0
AMM	139	4	8	1.5	0.3	136	0	4	0	8.0	0.8
AMT	592	1	44	2.2	1.3	577	0	44	0	9.5	0.4
AMX	347	1	3	1.7	-0.1	345	1	6	0	9.7	0.4
ANA	1184	0	4	1.6	0.0	1184	0	6	0	9.2	0.6
ANZ	3744	2	44	1.8	-0.1	3691	0	43	0	8.4	1.1
AOM	818	1	8	1.7	0.8	826	0	9	0	9.5	0.7
ARG	74	1	19	3.2	0.8	71	0	15	0	12.5	3.6
AVA	441	1	4	1.7	-0.1	445	0	4	0	8.8	0.5
AVN	84	0	1	1.1	0.3	84	0	2	0	9.4	0.2
AXA	132	2	45	1.4	0.3	126	0	45	0	9.7	0.1
AZA	434	1	38	2.5	0.6	412	0	15	0	10.4	1.2
BAL	533	1	13	1.7	-0.5	535	0	13	0	9.5	1.1
BAW	1658	1	18	2.0	-0.3	1586	0	15	0	8.8	0.8
BBB	34	0	6	1.3	-0.7	33	0	6	0	11.5	1.0
BLX	36	0	3	1.4	-0.6	35	0	6	0	8.7	0.5
BWA	350	1	14	2.5	1.9	323	0	10	0	10.0	1.0
CAL	1686	0	7	1.8	-0.2	1688	0	9	0	9.7	0.5
CCA	331	2	9	2.4	0.3	364	0	40	0	15.0	0.1
CDN	2093	0	11	1.9	0.4	2069	0	11	0	8.5	0.8
CES	337	0	9	2.1	0.3	344	1	12	0	9.9	1.1
CFC	29	0	34	3.9	1.0	34	0	24	0	10.6	-0.4
CFG	1099	1	5	1.7	-0.7	1085	0	4	0	8.5	0.8
CKS	384	4	47	1.4	0.9	391	0	45	0	7.3	0.5
CKT	178	1	10	2.1	0.4	170	1	10	0	9.2	0.9
CLX	356	1	7	1.8	-0.4	347	0	5	0	9.5	0.8
CMI	511	1	8	1.9	0.7	510	0	8	0	9.1	0.9
CMM	292	1	14	1.7	-0.1	285	0	14	0	8.6	0.6
COA	1850	1	29	1.8	0.2	1721	0	29	0	11.2	1.7
CPA	79	0	6	1.8	-0.2	81	0	7	0	8.5	0.4
CRL	404	0	8	1.5	0.3	399	0	9	0	7.8	0.7
CSN	81	0	12	2.2	0.7	82	0	13	0	8.7	2.1
CTB	268	0	4	1.7	-0.8	267	0	5	0	7.4	0.9
CTM	61	2	18	2.4	-1.3	60	0	17	0	6.8	-0.7
CUB	476	2	9	2.1	1.0	473	0	11	0	11.0	1.0
DAL	4814	1	37	2.1	0.6	4322	0	32	0	8.2	0.6
DBY	632	1	6	1.7	-0.7	626	0	7	0	8.6	0.6
DLH	2533	0	14	1.9	0.0	2459	0	12	0	8.2	0.7
EIA	336	1	34	1.6	0.9	316	0	33	0	8.4	2.0
EIN	33	0	3	2.6	0.6	34	0	0	0	8.0	0.5
ELY	125	2	8	1.9	-0.4	123	0	5	0	9.6	0.7
EVA	2103	0	5	1.7	-0.2	2141	0	7	0	9.6	0.5
EWW	63	0	14	1.8	0.9	59	0	76	0	8.9	1.3
FDX	1631	1	21	1.7	0.5	1572	0	19	0	8.2	1.0
FIN	458	1	10	1.8	0.2	412	0	7	0	8.5	0.1
FJI	949	5	43	1.7	0.3	906	0	40	0	8.7	1.3
FOM	186	2	42	1.8	0.0	183	0	40	0	6.7	1.3

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
GHA	52	0	2	2.0	-0.1	51	14	16	0	13.3	3.5
GIA	30	0	23	1.9	1.0	34	3	21	0	6.1	1.5
GTI	188	1	20	1.9	0.0	175	1	17	0	10.3	-0.5
HAL	3011	0	38	1.6	0.3	2994	0	39	0	9.8	0.9
HLF	95	0	14	2.1	-1.2	86	0	8	0	7.8	1.5
HRH	100	10	55	1.3	0.5	91	0	52	0	10.8	2.5
IBE	2523	1	21	1.9	0.5	2430	0	18	0	9.7	0.8
ICE	959	1	17	1.9	-0.1	834	0	10	0	7.2	0.3
JAL	6130	0	5	1.8	0.1	6133	0	6	0	9.0	0.9
JAZ	47	0	2	1.6	1.0	48	0	4	0	9.8	0.5
JKK	267	2	20	1.7	-0.1	233	0	12	0	7.8	1.0
KAL	2965	1	11	2.0	-0.2	2964	0	12	0	9.6	0.8
KIW	36	6	44	3.7	3.2	35	0	43	0	8.2	2.5
KLM	2844	0	15	1.7	0.1	2755	0	13	0	8.1	0.5
LAN	26	12	27	3.7	0.8	23	0	22	0	12.5	1.2
LAP	52	2	10	3.1	1.3	53	0	100	0	13.1	4.0
LDA	182	1	19	2.2	-0.4	171	0	15	0	8.6	1.7
LDI	366	10	56	3.9	1.9	349	0	20	0	9.5	0.6
LIB	322	3	8	1.8	0.9	318	0	7	0	9.3	0.6
LOT	106	0	8	2.0	-0.7	100	0	3	0	8.6	-0.7
LPR	33	6	15	2.6	-0.6	32	0	9	0	12.5	0.5
LTU	826	1	15	1.8	-0.3	746	0	9	0	8.6	1.2
LXR	34	0	24	1.9	0.9	33	0	21	0	7.4	0.4
MAS	330	1	7	2.0	-0.3	345	1	9	0	11.4	0.7
MDA	98	0	0	1.7	0.3	99	0	0	0	8.5	-1.3
MPD	218	1	16	2.0	0.6	201	0	10	0	9.6	0.5
MPH	761	1	7	1.7	-0.5	734	0	5	0	9.0	0.6
NCA	613	1	4	1.8	0.3	607	0	5	0	8.8	0.6
NJS	21	0	29	3.0	1.8	21	0	29	0	9.1	-0.2
NWA	9419	1	12	1.9	0.6	9292	0	12	0	8.8	0.7
PAC	239	1	19	1.7	0.7	234	0	20	0	9.5	1.2
PAL	395	1	10	1.5	0.3	384	1	12	0	9.4	1.3
PAO	298	2	42	1.8	0.1	291	0	41	0	8.2	1.1
PAQ	26	0	19	2.4	-0.1	26	0	15	0	10.4	2.2
QFA	1732	1	49	1.9	-0.1	1709	0	48	0	8.3	0.9
RAF	94	0	3	1.8	0.8	93	0	5	0	10.8	2.0
RAM	82	4	15	2.2	-0.7	82	2	11	0	10.0	1.9
RCH	494	2	24	2.0	0.3	475	0	24	0	10.7	2.2
RJA	47	0	28	2.2	0.0	40	0	13	0	6.9	0.9
RKA	72	0	4	1.9	-1.0	71	0	4	0	9.1	2.6
ROY	23	0	30	1.1	-0.1	24	0	29	0	6.0	2.7
RRR	129	0	15	1.6	0.2	126	0	11	0	6.3	1.7
RYN	340	0	46	1.9	0.5	338	0	44	0	8.9	1.0
SAA	299	1	4	1.4	-0.3	293	0	3	0	8.2	0.3
SAB	58	2	22	1.6	0.1	48	0	15	0	6.7	0.7
SAS	1505	0	1	1.8	-0.1	1499	0	2	0	8.4	0.2
SIA	1001	0	8	1.9	-0.7	997	0	8	0	9.0	0.4
SLR	197	1	13	1.7	-0.4	197	1	15	0	9.9	0.5
SOL	70	1	9	1.4	0.0	70	0	9	0	8.1	0.1
SVA	93	1	2	1.8	-0.2	98	0	7	0	11.4	0.1
SVV	27	0	7	3.3	-1.8	27	0	7	0	9.1	2.7
SWR	134	0	13	1.9	-0.4	123	1	9	0	7.7	1.2
TAP	541	0	6	1.7	-0.4	536	0	6	0	9.2	1.2
TBA	26	8	31	2.4	1.5	27	0	33	0	18.8	0.4
TCO	34	0	6	1.4	-0.5	31	0	3	0	12.3	1.3
THA	421	0	11	2.1	-0.6	428	0	13	0	11.2	-0.3
THT	37	0	19	2.3	1.2	36	0	17	0	6.7	-0.1
TOW	89	1	15	1.8	-0.2	87	0	13	0	11.4	0.7
TPA	31	0	6	0.8	0.0	31	0	13	0	8.9	0.8

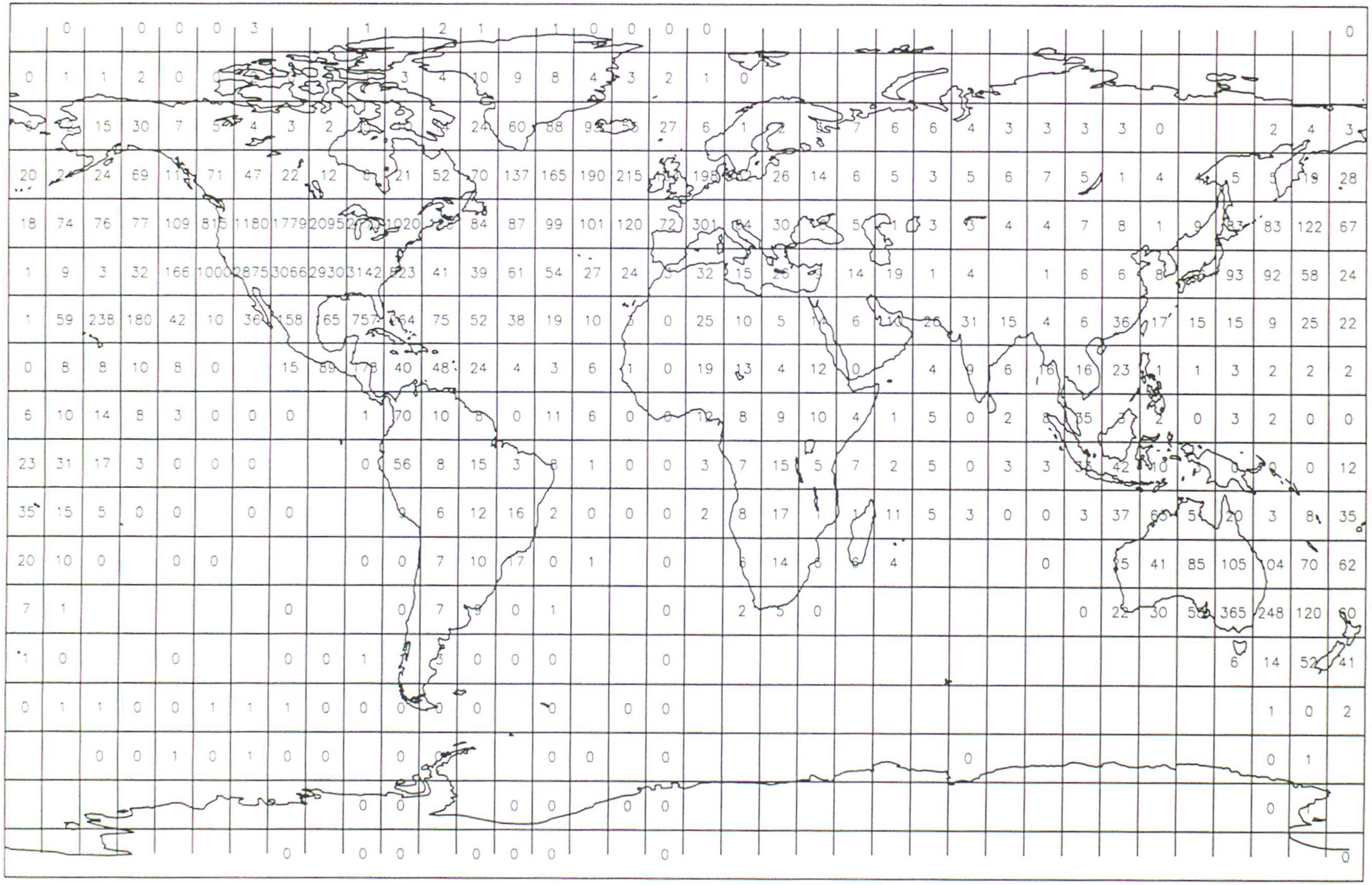
IDENT.	TEMPERATURE					WIND					
	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TWA	1190	1	25	2.2	0.8	1069	0	20	0	8.7	1.0
UAL	102164	1	86	1.3	-0.1	101988	0	86	0	6.9	0.6
UPS	1320	0	36	1.8	0.3	1273	0	35	0	7.4	0.8
USA	267	1	21	2.3	-0.3	234	0	13	0	9.0	2.1
VIR	341	1	10	2.0	-0.5	331	0	6	0	8.9	0.5
VKG	77	0	1	1.6	0.3	77	0	0	0	6.8	0.3
VPB	33	0	24	1.9	0.8	33	0	24	0	6.8	0.9
VRG	213	4	35	1.7	1.1	188	0	100	0	9.4	0.9
VSP	130	2	16	2.0	0.3	126	0	16	0	10.3	1.6
VVR	55	4	42	2.9	1.1	54	0	43	0	8.8	1.6
WOA	72	0	10	1.8	0.3	69	0	7	0	7.1	1.3
ZKN	3243	0	1	1.2	0.0	3243	0	1	0	6.1	0.6
AN	20859	0	1	1.3	0.1	20859	0	1	0	6.4	0.9
BA	26881	3	5	1.6	0.4	26840	0	1	0	6.4	0.9
IT	311	0	56	1.1	0.0	309	0	59	0	6.8	0.5
KL	8446	0	8	1.6	0.9	8431	0	8	0	6.8	0.7
LH	2912	0	1	1.6	0.9	2983	0	1	0	6.3	0.7
MK	2814	0	0	1.7	1.2	2813	0	0	0	7.7	1.8
QF	18531	0	2	1.3	0.4	18531	0	2	0	6.4	0.9
SA	3916	0	1	1.8	1.3	3915	0	2	0	8.1	1.4
SV	1593	0	1	1.7	1.2	1582	0	0	0	6.2	0.5
UA	3454	1	32	1.6	0.0	3663	0	32	0	9.3	1.6
WA	794	6	15	1.7	0.5	784	3	21	0	14.3	-2.8
XX	4000	1	7	1.6	0.3	4731	0	100	0	13.8	1.1
I	25	0	8	2.1	-1.6	25	0	4	0	6.6	2.5
N	727	2	26	2.6	0.4	724	0	23	0	9.0	1.0
ADS	1490	0	0	1.3	-0.2	1490	0	0	0	5.8	0.4
US ACARS	509810	0	12	1.3	0.2	509828	0	13	0	6.7	0.7

MEAN DAILY COUNT OF AIRCRAFT 70 - 500 HPA

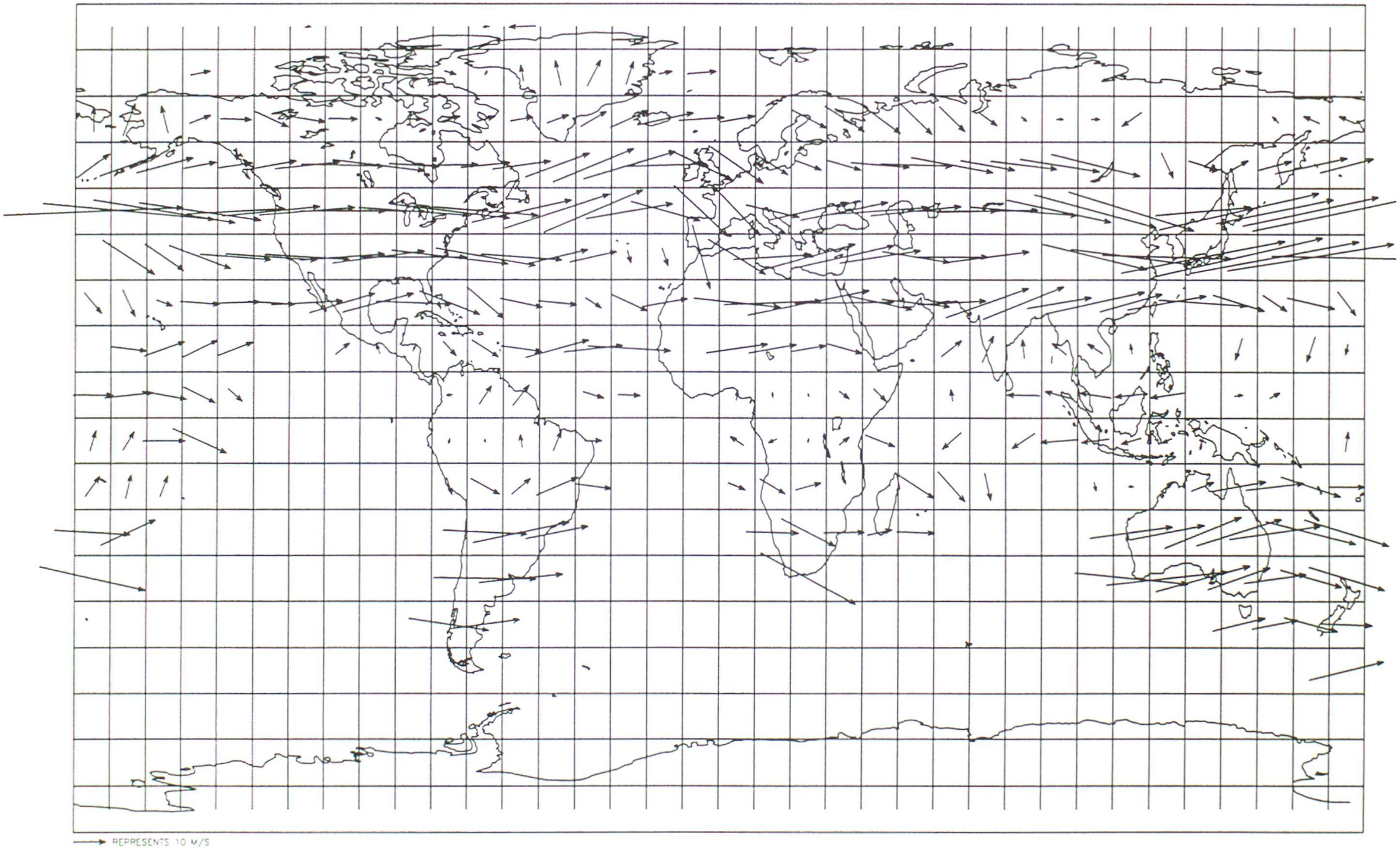
FIGURE 3

NOVEMBER 1998

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

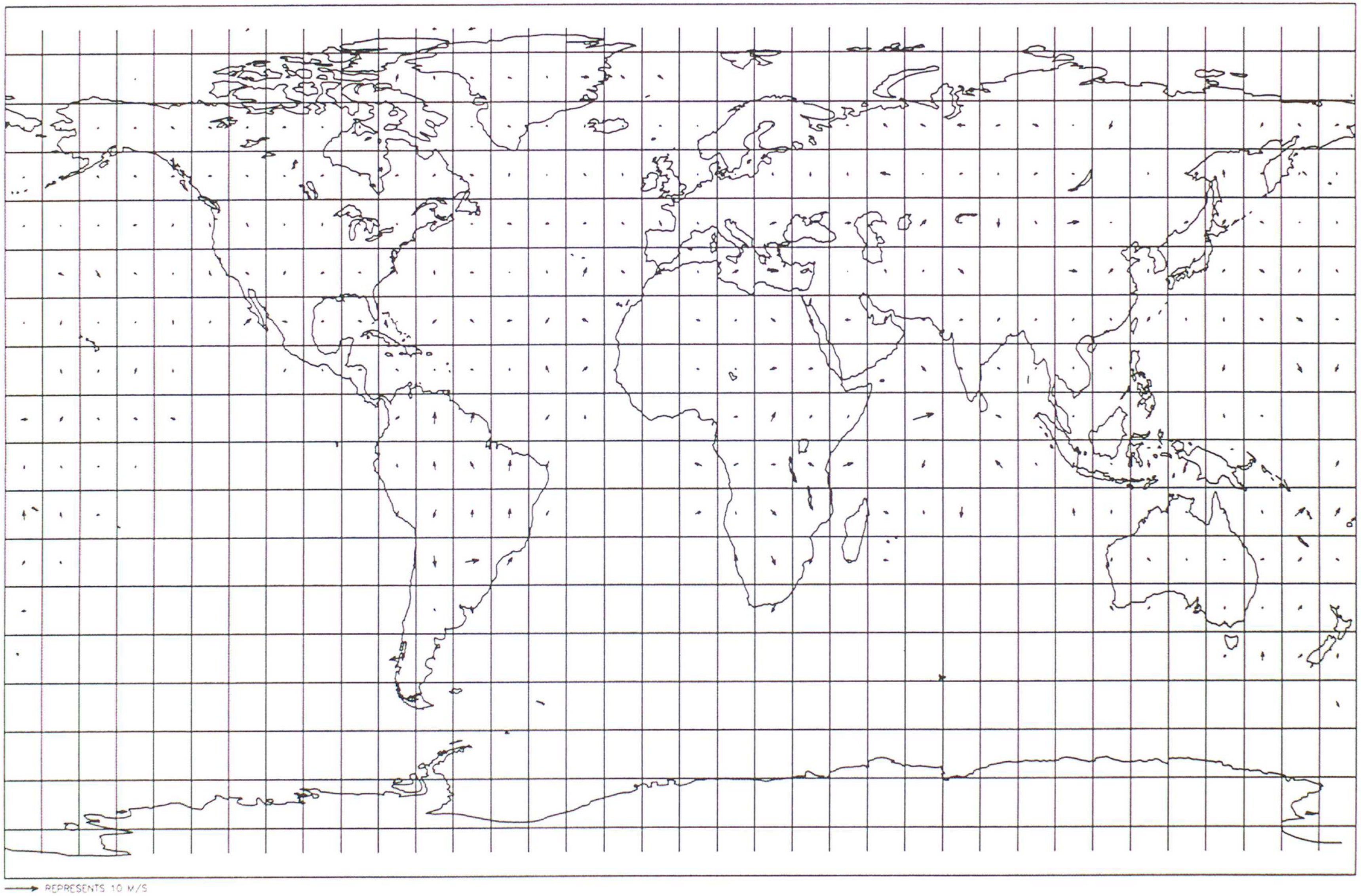

0 0 0 0 3 1 2 1 1 0 0 0 0 0
0 1 1 2 0 0 3 4 10 9 8 4 3 2 1 0
15 30 7 5 4 3 2 0 0 4 24 60 88 93 55 27 6 1 2 7 6 6 4 3 3 3 3 0 2 4 3
20 24 24 69 11 71 47 22 12 8 21 52 70 137 165 190 215 195 2 26 14 6 5 3 5 6 7 5 1 4 5 5 19 28
18 74 76 77 109 815 1180 1779 2095 2770 1020 84 87 99 101 120 72 301 64 30 5 1 3 3 4 4 7 8 1 9 83 83 122 67
1 9 3 32 166 1000 2875 3066 2930 3142 623 41 39 61 54 27 24 5 32 15 25 14 19 1 4 1 6 6 8 93 92 58 24
1 59 238 180 42 10 36 158 165 757 364 75 52 38 19 10 5 0 25 10 5 14 6 18 26 31 15 4 6 36 17 15 15 9 25 22
0 8 8 10 8 0 15 89 178 40 48 24 4 3 6 1 0 19 13 4 12 0 4 9 6 16 16 23 1 1 3 2 2 2
6 10 14 8 3 0 0 0 1 70 10 8 0 11 6 0 0 12 8 9 10 4 1 5 0 2 8 35 3 2 0 3 2 0 0
23 31 17 3 0 0 0 0 56 8 15 3 8 1 0 0 3 7 15 5 7 2 5 0 3 3 33 42 10 3 0 0 0 12
35 15 5 0 0 0 0 9 6 12 16 2 0 0 0 2 8 17 1 1 11 5 3 0 0 3 37 60 5 20 3 8 35
20 10 0 0 0 0 0 7 10 17 0 1 0 6 14 8 6 4 0 15 41 85 105 104 70 62
7 1 0 0 7 9 0 1 0 2 5 0 0 22 30 53 365 248 120 60
1 0 0 0 0 1 3 0 0 0 0 6 14 52 41
0 1 1 0 0 1 1 1 0 0 0 0 0 0 0 0 1 0 2
0 0 1 0 1 0 0 0 0 0 0 0 0 0 1
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0

AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA FIGURE 4
NOVEMBER 1998
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

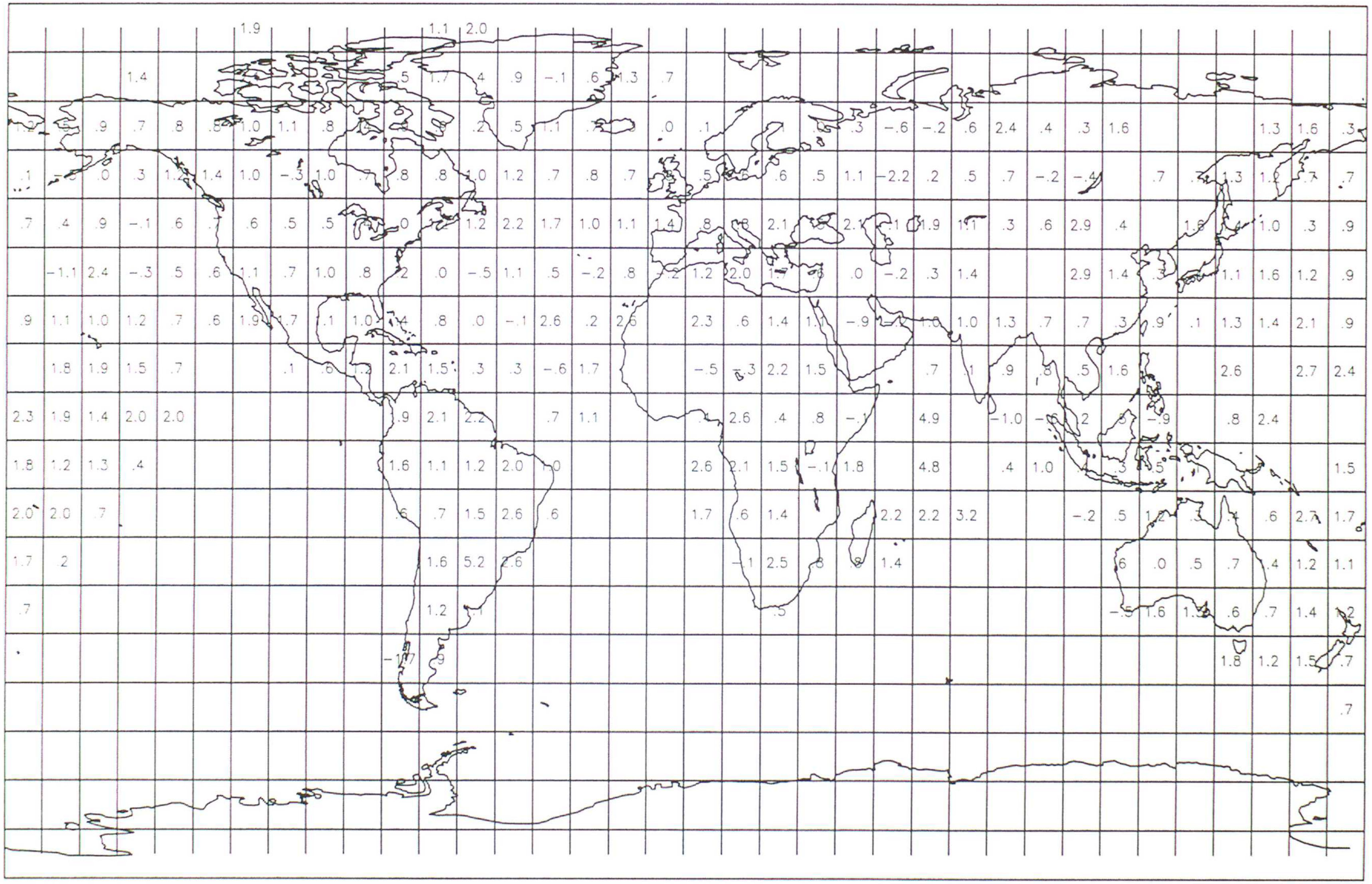


AIRCRAFT MEAN O−B WINDS BETWEEN 70 AND 500 HPA
NOVEMBER 1998
OBSERVATIONS WITH O−B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 5



AIRCRAFT : MEAN O–B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
NOVEMBER 1998
OBSERVATIONS WITH O–B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


1.9 1.1 2.0
1.4 .5 1.7 .4 .9 −.1 .6 1.3 .7
.5 .9 .7 .8 .8 1.0 1.1 .8 .2 .5 1.1 .0 .1 .3 −.6 −.2 .6 2.4 .4 .3 1.6 1.3 1.6 .3
.1 .0 .3 1.2 1.4 1.0 −.3 1.0 .7 .8 .8 1.0 1.2 .7 .8 .7 .5 .6 .5 1.1 −2.2 .2 .5 .7 −.2 −.4 .7 .3 1.3 1.2 .7 .7
.7 .4 .9 −.1 .6 .7 .6 .5 .5 .4 .0 .2 1.2 2.2 1.7 1.0 1.1 1.4 .8 .8 2.1 .5 2.1 1.1 1.9 1.1 .3 .6 2.9 .4 1.6 .4 1.0 .3 .9
−1.1 2.4 −.3 .5 .6 1.1 .7 1.0 .8 .2 .0 −.5 1.1 .5 −.2 .8 .2 1.2 2.0 1.7 .6 .0 −.2 .3 1.4 2.9 1.4 .3 1.1 1.6 1.2 .9
.9 1.1 1.0 1.2 .7 .6 1.9 .7 .1 1.0 .4 .8 .0 −.1 2.6 .2 2.6 2.3 .6 1.4 1.1 −.9 1.0 1.0 1.3 .7 .7 .3 .9 .1 1.3 1.4 2.1 .9
1.8 1.9 1.5 .7 .1 .6 .2 2.1 1.5 .3 .3 −.6 1.7 −.5 .3 2.2 1.5 .7 .1 .9 .8 .5 1.6 2.6 2.7 2.4
2.3 1.9 1.4 2.0 2.0 .9 2.1 2.2 .7 1.1 2.6 .4 .8 −.1 4.9 −1.0 −.6 .2 .3 −.9 .8 2.4
1.8 1.2 1.3 .4 1.6 1.1 1.2 2.0 1.0 2.6 2.1 1.5 −.1 1.8 4.8 .4 1.0 .4 .3 .5 1.5
2.0 2.0 .7 .6 .7 1.5 2.6 .6 1.7 .6 1.4 2.2 2.2 3.2 −.2 .5 1.2 .3 .4 .6 2.7 1.7
1.7 .2 1.6 5.2 2.6 −.1 2.5 .8 .8 1.4 .6 .0 .5 .7 .4 1.2 1.1
.7 1.2 .1 .5 −.5 1.6 1.3 .6 .7 1.4 .2
−1.7 .9 1.8 1.2 1.5 .7
.7

AIRCRAFT : RMS O–B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
NOVEMBER 1998
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

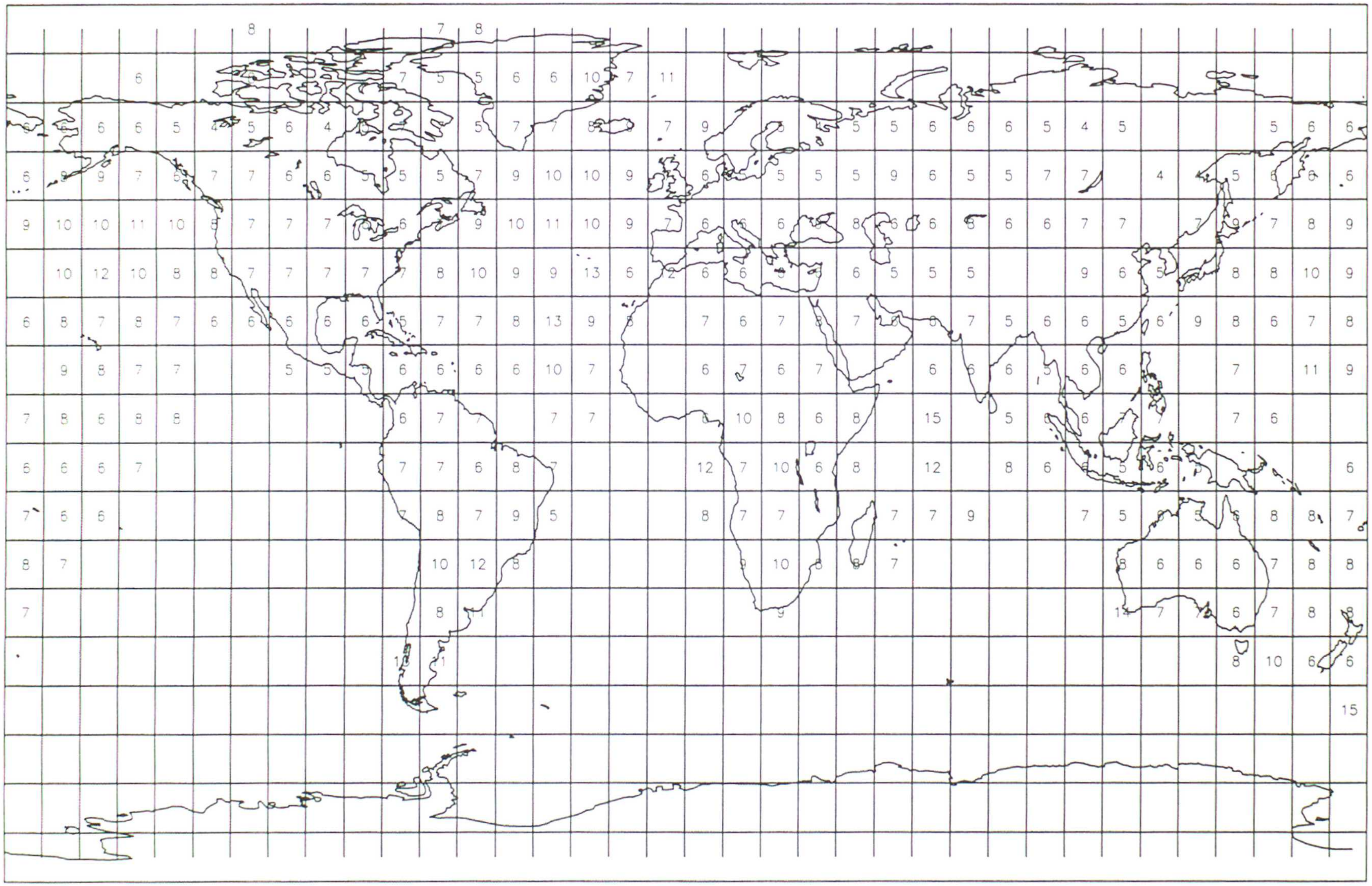

8 7 8
6 7 5 5 6 6 10 7 11
6 6 6 6 5 4 5 6 4 5 7 7 8 7 9 6 5 5 6 6 6 5 4 5 5 6 6
6 8 9 7 5 7 7 6 6 5 5 5 7 9 10 10 9 6 5 5 5 5 9 6 5 5 7 7 4 4 5 6 6 6
9 10 10 11 10 8 7 7 7 7 6 9 10 11 10 9 7 6 6 6 8 6 6 6 6 6 7 7 7 9 7 8 9
10 12 10 8 8 7 7 7 7 7 8 10 9 9 13 6 2 6 6 6 5 5 5 9 6 5 8 8 10 9
6 8 7 8 7 6 6 6 6 6 5 7 7 8 13 9 8 7 6 7 8 7 6 6 7 5 6 6 5 6 9 8 6 7 8
9 8 7 7 5 5 5 6 6 6 6 10 7 6 7 6 7 6 6 6 5 6 6 7 11 9
7 8 6 8 8 6 7 7 7 7 6 10 8 6 8 15 5 6 6 7 7 6
6 6 6 7 7 7 6 8 7 12 7 10 6 8 12 8 6 6 5 6 6
7 6 6 7 8 7 9 5 8 7 7 7 7 9 7 5 6 5 6 8 8 7
8 7 10 12 8 9 10 8 8 7 8 6 6 6 7 8 8
7 8 11 9 14 7 7 6 7 8 8
13 11 8 10 6 6
15

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
33658	00	Z	100	48/ 26	14	0	37.6	180.9	184.8	6
33837	00	Z	100	46/ 31	18	0	94.3	-86.7	128.1	4
33946	00	Z	50	45/ 34	12	0	39.5	161.8	166.6	6
41977	00	Z	200	22/ 92	13	1	73.3	-60.0	94.7	4
42027	00	Z	200	34/ 75	11	0	69.1	-136.6	153.1	5
42027	12	Z	250	34/ 75	17	0	98.2	-0.4	98.2	5
42314	12	Z	200	27/ 95	18	0	77.6	-47.2	90.8	5
42339	12	Z	150	26/ 73	15	0	59.4	105.1	120.7	5
42361	00	Z	200	26/ 78	13	0	75.8	-73.2	105.4	7
42369	00	Z	100	27/ 81	24	0	86.4	-97.2	130.1	5
42379	00	Z	100	27/ 83	21	0	93.6	-90.0	129.8	4
42397	00	Z	200	27/ 88	26	0	64.0	-73.1	97.2	9
42397	12	Z	100	27/ 88	16	1	61.2	-146.6	158.9	7
43003	12	Z	150	19/ 73	21	1	66.4	130.2	146.1	6
43014	00	Z	200	20/ 75	15	1	83.4	-95.0	126.4	5
43185	00	Z	100	16/ 81	21	0	124.1	-15.5	125.1	4
43185	12	Z	100	16/ 81	17	1	110.8	77.5	135.2	7
43311	00	Z	150	11/ 73	14	0	83.9	76.6	113.6	4
43369	00	Z	100	8/ 73	22	1	83.4	-92.8	124.8	5
43371	12	Z	150	8/ 77	26	0	81.1	86.3	118.5	4
53463	12	Z	1000	41/ 112	30	0	15.9	32.3	36.0	4
65578	12	Z	200	5/ -4	24	0	24.4	92.9	96.1	9
84628	12	Z	850	-12/ -77	26	0	6.3	-70.7	71.0	6
89009	00	Z	850	-90/ 0	19	6	40.0	63.3	74.8	7
89009	12	Z	850	-90/ 0	14	3	23.6	69.6	73.5	8
89512	00	Z	1000	-71/ 12	19	8	31.4	83.5	89.2	10
89664	00	Z	100	-78/ 167	16	1	68.9	120.2	138.6	6
89664	12	Z	250	-78/ 167	12	1	62.0	86.4	106.3	7
97180	00	Z	200	-5/ 120	24	0	87.9	-32.1	93.6	4
97560	00	Z	400	-1/ 136	10	0	42.5	-46.3	62.9	4

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – NOVEMBER 1998 FIGURE 8
ALL HOURS
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1138

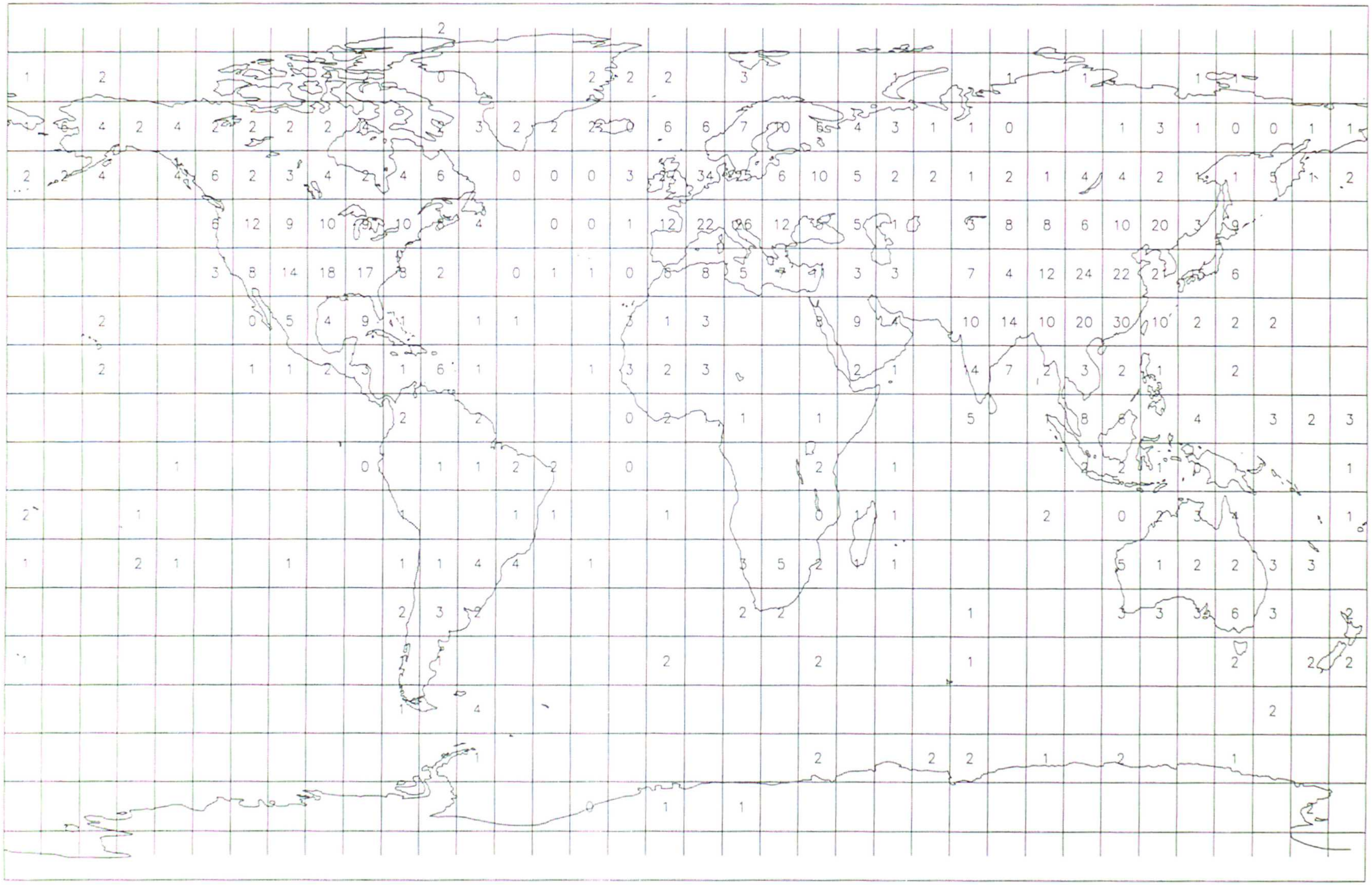


TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored		
	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.	

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
07761	12	V	250	42/ 9	20	0	10	4.5	-0.2	16.7	1
42182	00	V	150	29/ 77	18	1	21	5.7	0.3	16.7	1
47058	00	V	300	39/ 126	10	0	20	-8.8	8.5	17.9	1
53915	12	V	150	36/ 107	27	0	11	12.1	-0.6	17.6	2
68906	12	V	300	-40/ -10	17	0	11	-5.5	-4.0	16.1	1

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – NOVEMBER 1998 FIGURE 9
ALL HOURS
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1241

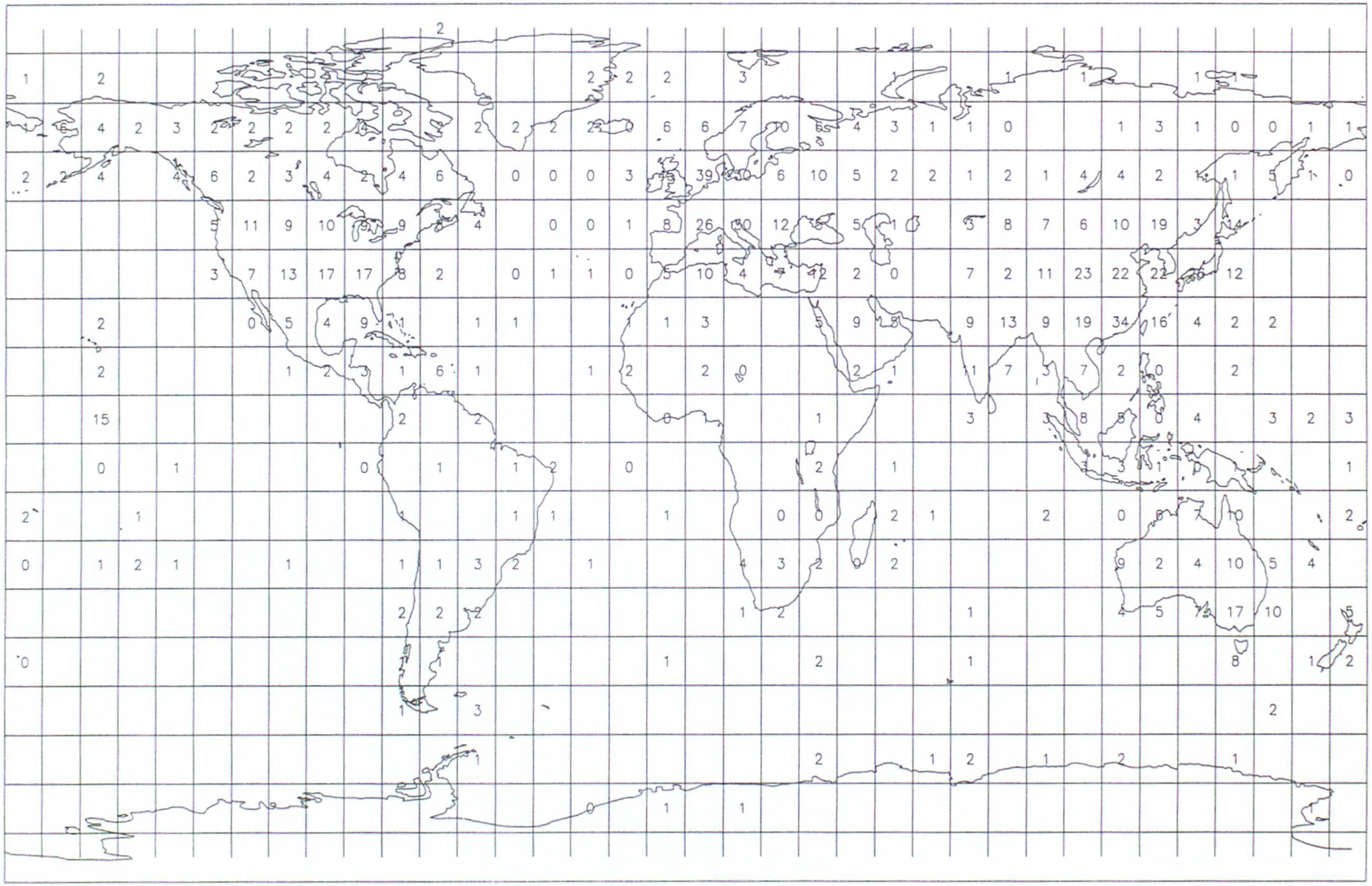


TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for radiosonde TEMPs.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from Bracknell global model.
Observation times	:00 UTC and 12 UTC.
Level(s) monitored	:Standard levels between 500.0 - 150.0 hPa
Element monitored	:WIND DIRECTION in degrees

Parameters monitored

:NUM OBS	:Average number of observations at all levels.
:BIAS	:Mean difference of observations from background values from all levels.
:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA

:NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
33791	12	DD	48/ 33	21	10.9	9.1	20.7
34731	00	DD	47/ 40	21	11.7	4.7	9.4
42339	00	DD	26/ 73	22	17.6	4.2	10.2
42339	12	DD	26/ 73	19	19.4	3.1	10.4
42701	00	DD	23/ 85	18	20.0	9.5	21.1
42701	12	DD	23/ 85	16	18.2	5.5	16.5
43346	12	DD	11/ 80	20	12.2	8.7	24.4
48565	00	DD	8/ 98	16	12.0	6.1	20.0
48568	00	DD	7/ 101	17	24.7	4.5	22.1
48601	00	DD	5/ 100	17	10.5	4.6	21.2
59280	12	DD	24/ 113	29	11.0	5.3	10.2
59758	00	DD	20/ 110	17	13.0	5.8	19.0
59758	12	DD	20/ 110	17	13.7	8.9	22.1
62337	00	DD	31/ 34	26	-17.7	5.1	11.1
62337	12	DD	31/ 34	26	-18.7	4.7	11.1

MONITORING OF SATELLITE WINDS

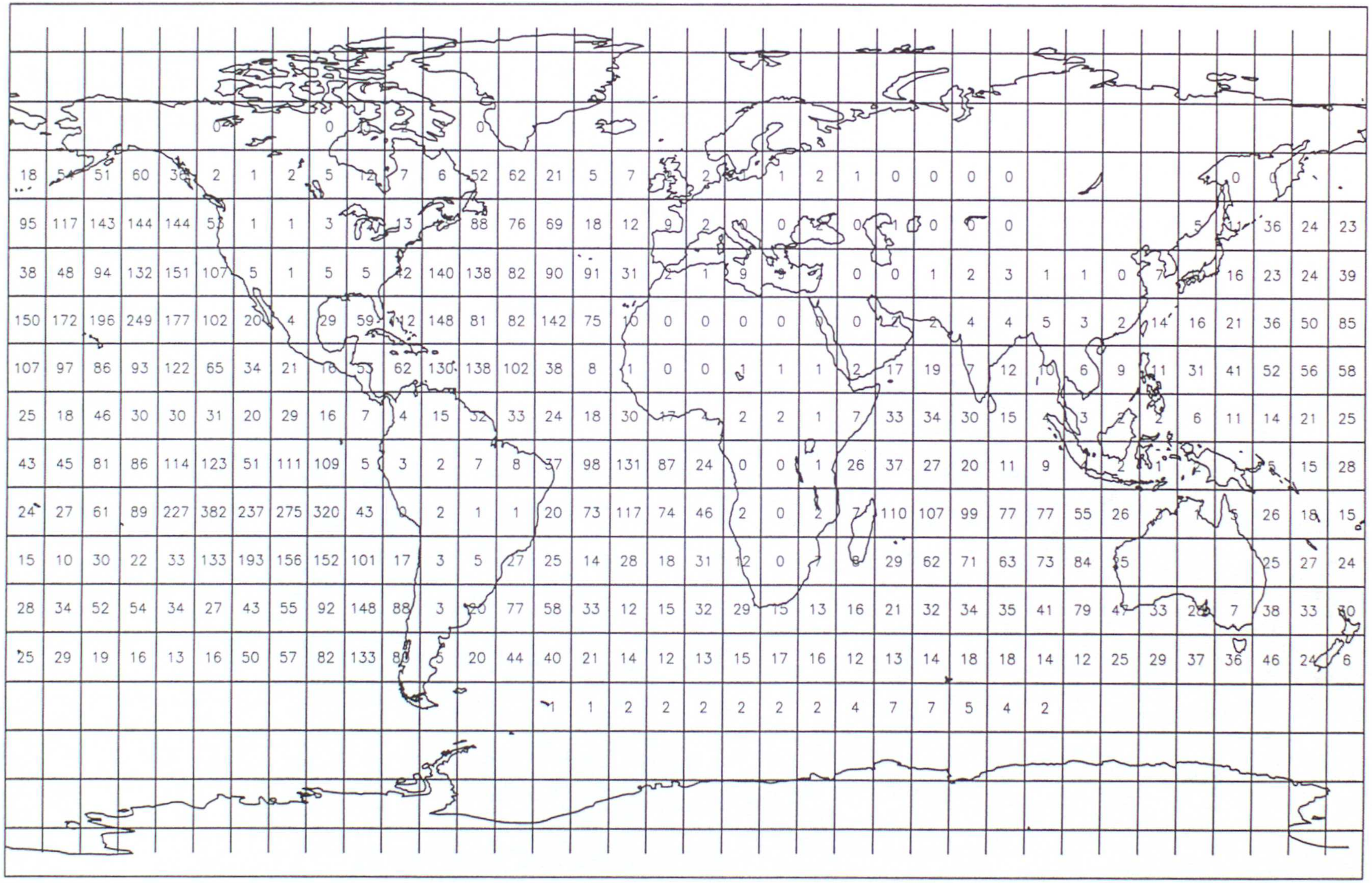
MONITORING CENTRE: BRACKNELL

MONTH: November 1998

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES, METEOSAT, GMS, INSAT.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa
	:Mean wind
	:Mean observation minus background vector wind differences
	:Mean observation minus background speed differences
	:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
NOVEMBER 1998


0 0 0
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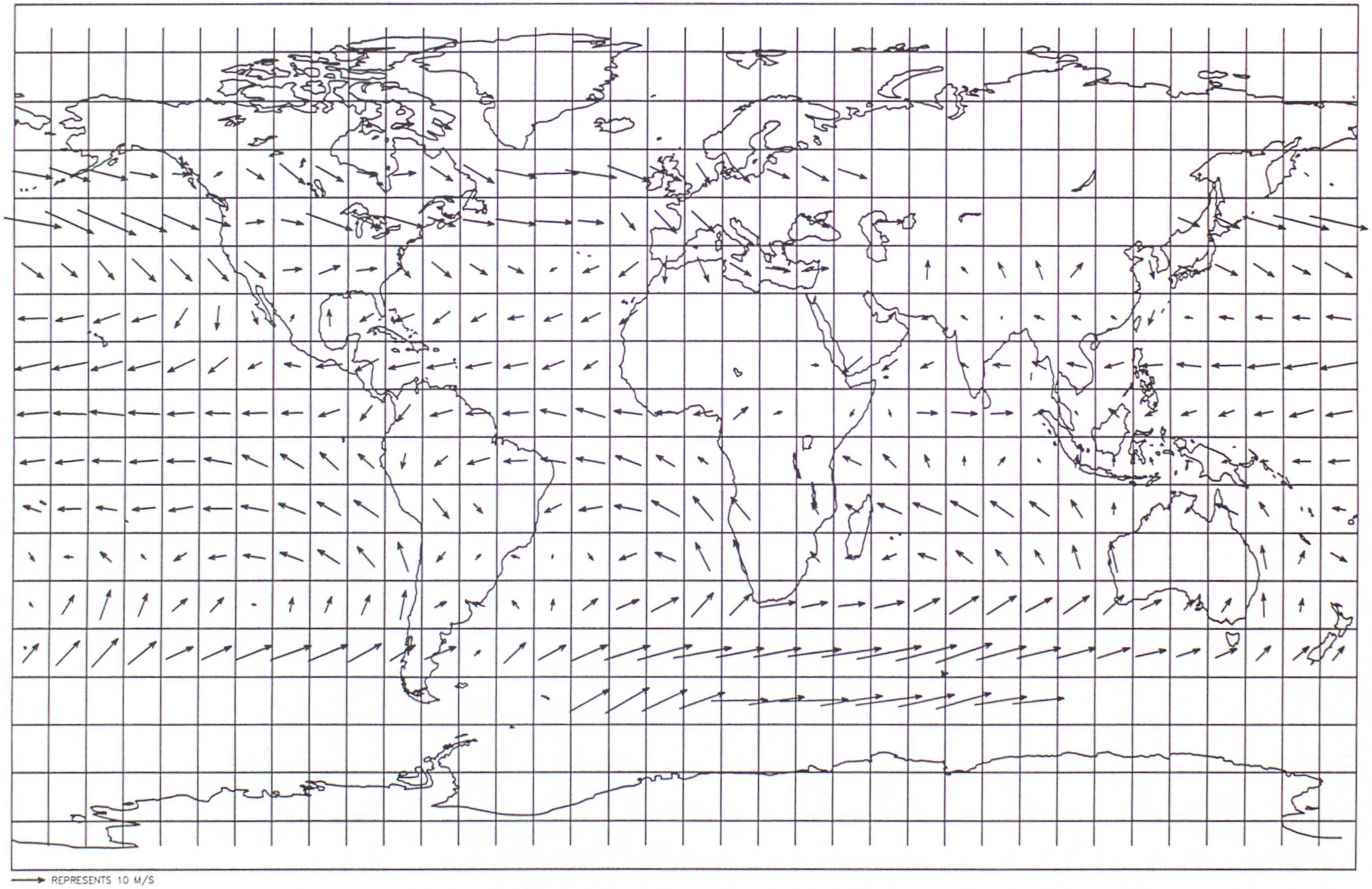
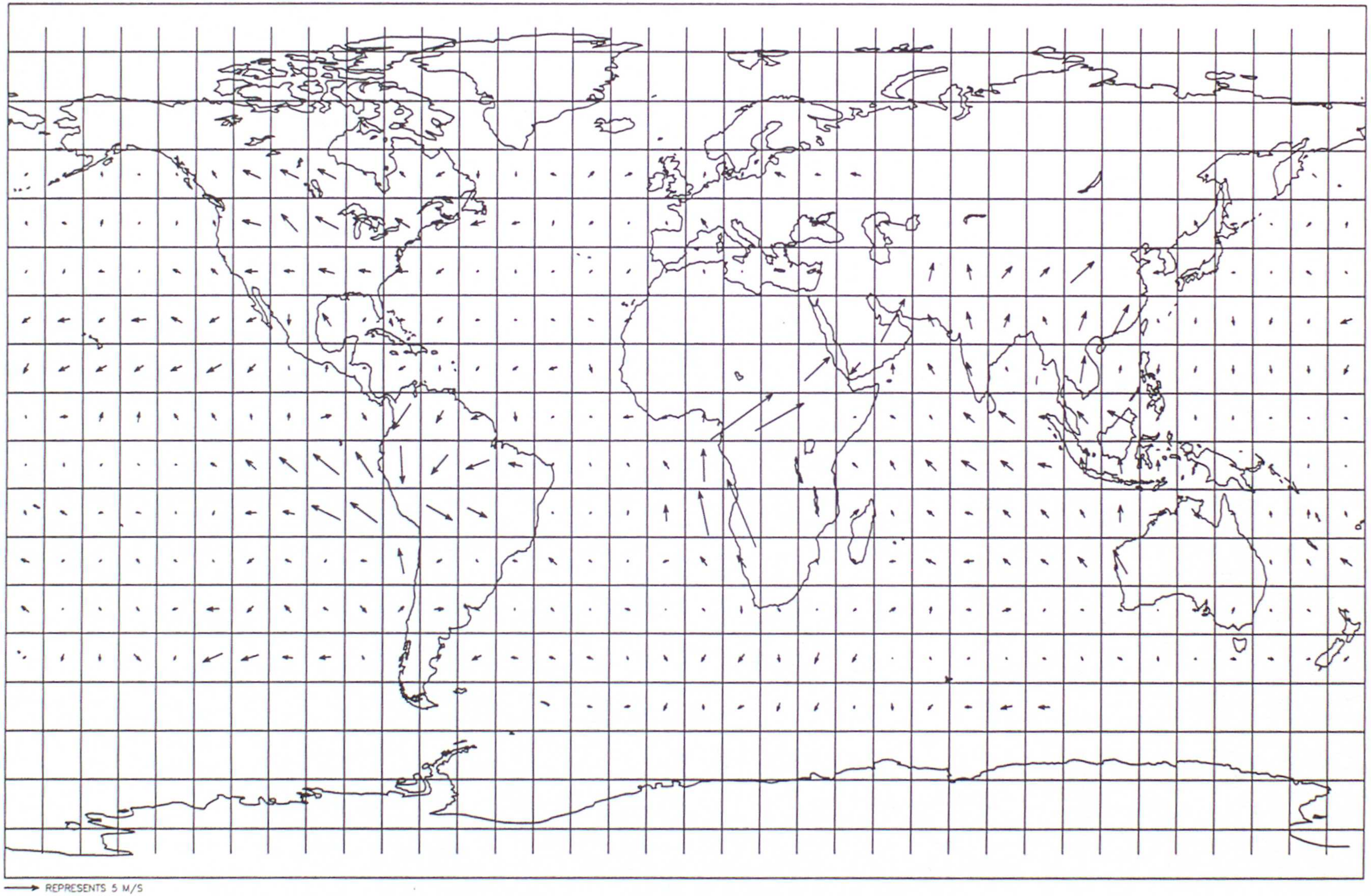
95 117 143 144 144 53 1 1 3 13 88 76 69 18 12 9 2 0 0 2 0 1 0 0 0 5 11 36 24 23
38 48 94 132 151 107 5 1 5 5 12 140 138 82 90 91 31 2 1 9 9 2 0 0 1 2 3 1 1 0 7 16 23 24 39
150 172 196 249 177 102 20 4 29 59 12 148 81 82 142 75 10 0 0 0 0 0 0 2 2 4 4 5 3 2 14 16 21 36 50 85
107 97 86 93 122 65 34 21 16 53 62 130 138 102 38 8 1 0 0 1 1 1 2 17 19 7 12 10 6 9 11 31 41 52 56 58
25 18 46 30 30 31 20 29 16 7 4 15 32 33 24 18 30 17 4 2 2 1 7 33 34 30 15 4 3 2 2 6 11 14 21 25
43 45 81 86 114 123 51 111 109 5 3 2 7 8 37 98 131 87 24 0 0 1 26 37 27 20 11 9 4 2 1 2 1 5 15 28
24 27 61 89 227 382 237 275 320 43 0 2 1 1 20 73 117 74 46 2 0 2 7 110 107 99 77 77 55 26 7 1 5 26 18 15
15 10 30 22 33 133 193 156 152 101 17 3 5 27 25 14 28 18 31 12 0 7 8 29 62 71 63 73 84 35 25 27 24
28 34 52 54 34 27 43 55 92 148 88 3 20 77 58 33 12 15 32 29 15 13 16 21 32 34 35 41 79 47 33 28 7 38 33 30
25 29 19 16 13 16 50 57 82 133 80 5 20 44 40 21 14 12 13 15 17 16 12 13 14 18 18 14 12 25 29 37 36 46 24 6
1 1 2 2 2 2 2 2 4 7 7 5 4 2

SATOB VECTOR MEAN WINDS BETWEEN 701–1000 HPA
NOVEMBER 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

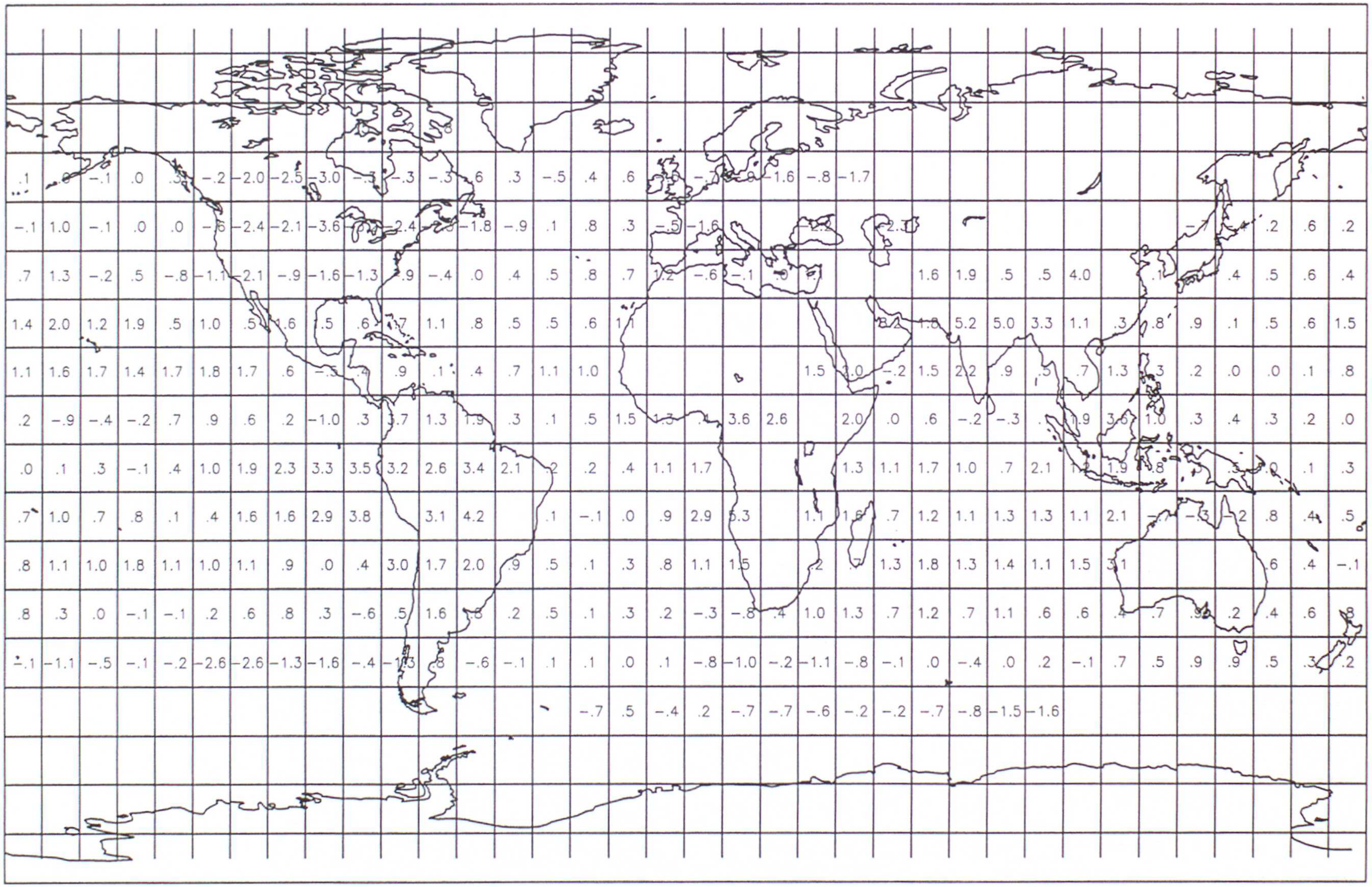
FIGURE 11


REPRESENTS 10 M/S

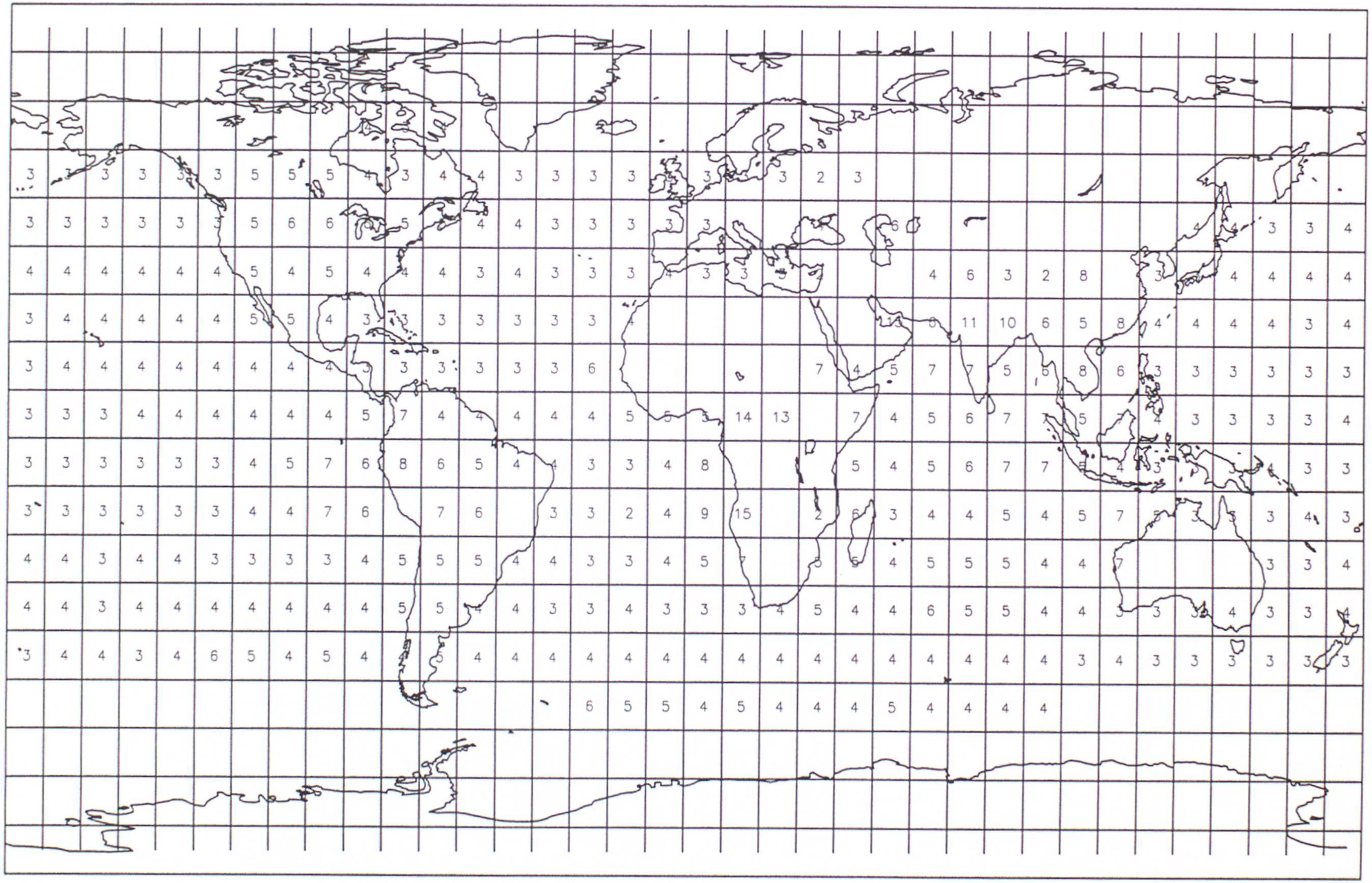
SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 701–1000 HPA FIGURE 12
NOVEMBER 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT



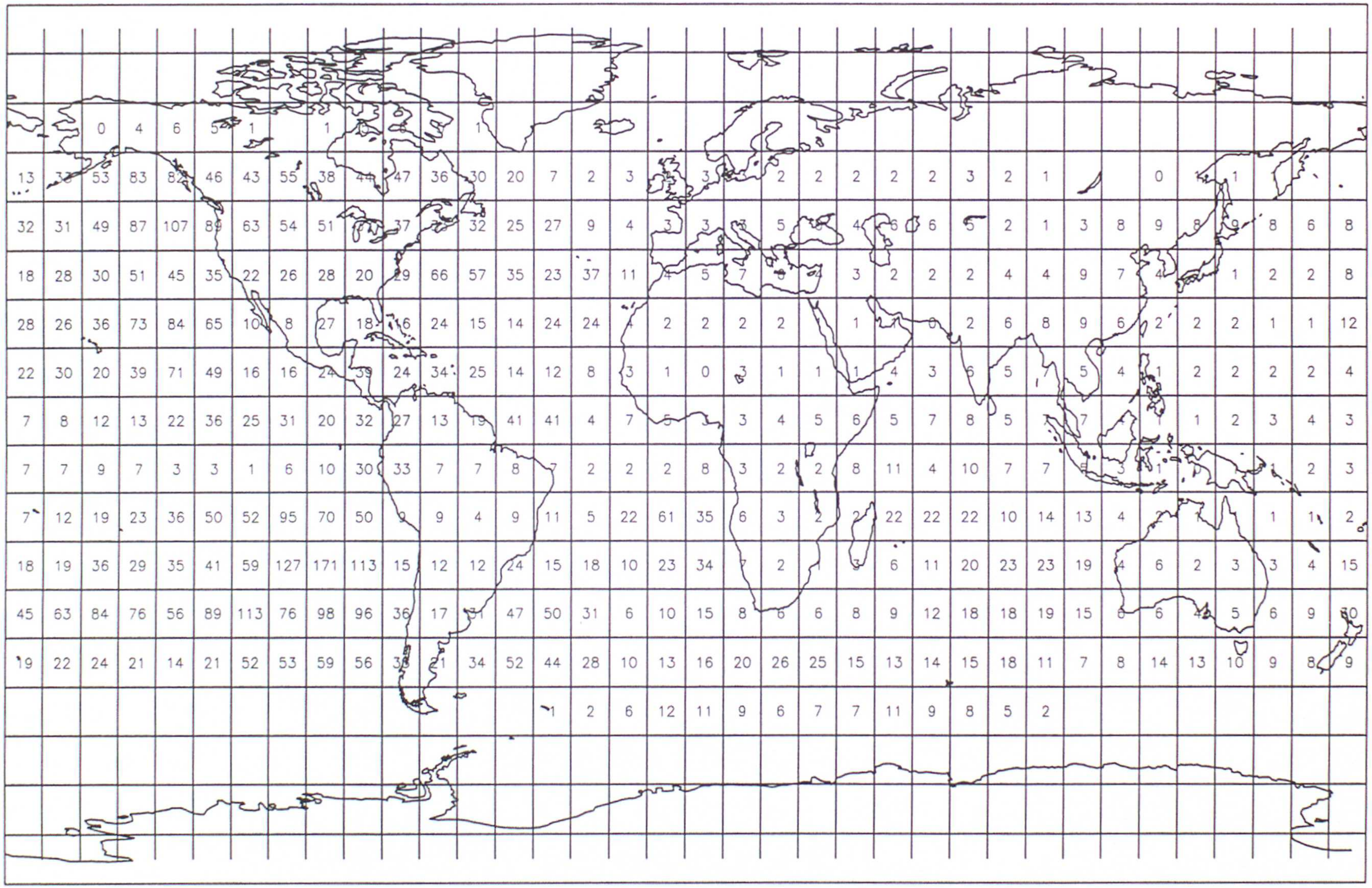
SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
NOVEMBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


.1 −.1 .0 .3 −.2 −2.0 −2.5 −3.0 −.3 −.3 −.3 .6 .3 −.5 .4 .6 −.7 −.8 −1.6 −.8 −1.7
−.1 1.0 −.1 .0 .0 −.6 −2.4 −2.1 −3.6 −2.4 −1.8 −.9 .1 .8 .3 −.5 −1.6 −2.2 −2.3 −.7 −.4 .2 .6 .2
.7 1.3 −.2 .5 −.8 −1.1 −2.1 −.9 −1.6 −1.3 .9 −.4 .0 .4 .5 .8 .7 1.2 −.6 −.1 .0 1.6 1.9 .5 .5 4.0 .1 .4 .5 .6 .4
1.4 2.0 1.2 1.9 .5 1.0 .5 1.6 .5 .6 .7 1.1 .8 .5 .5 .6 1.1 3.2 1.8 5.2 5.0 3.3 1.1 .3 .8 .9 .1 .5 .6 1.5
1.1 1.6 1.7 1.4 1.7 1.8 1.7 .6 −.5 .4 .9 .1 .4 .7 1.1 1.0 1.5 2.0 −.2 1.5 2.2 .9 .5 .7 1.3 .3 .2 .0 .0 .1 .8
.2 −.9 −.4 −.2 .7 .9 .6 .2 −1.0 .3 3.7 1.3 1.9 .3 .1 .5 1.5 1.3 .4 3.6 2.6 2.0 .0 .6 −.2 −.3 1.9 3.6 1.0 .3 .4 .3 .2 .0
.0 .1 .3 −.1 .4 1.0 1.9 2.3 3.3 3.5 3.2 2.6 3.4 2.1 .2 .2 .4 1.1 1.7 1.3 1.1 1.7 1.0 .7 2.1 1.2 1.9 .8 .0 .1 .3
.7 1.0 .7 .8 .1 .4 1.6 1.6 2.9 3.8 3.1 4.2 .1 −.1 .0 .9 2.9 5.3 1.1 1.6 .7 1.2 1.1 1.3 1.3 1.1 2.1 −.7 −.3 .2 .8 .4 .5
.8 1.1 1.0 1.8 1.1 1.0 1.1 .9 .0 .4 3.0 1.7 2.0 .9 .5 .1 .3 .8 1.1 1.5 .2 .7 1.3 1.8 1.3 1.4 1.1 1.5 3.1 .6 .4 −.1
.8 .3 .0 −.1 −.1 .2 .6 .8 .3 −.6 .5 1.6 .8 .2 .5 .1 .3 .2 −.3 −.8 .4 1.0 1.3 .7 1.2 .7 1.1 .6 .6 .4 .7 .9 .2 .4 .6 .8
−.1 −1.1 −.5 −.1 −.2 −2.6 −2.6 −1.3 −1.6 −.4 −1.3 .8 −.6 −.1 .1 .1 .0 .1 −.8 −1.0 −.2 −1.1 −.8 −.1 .0 −.4 .0 .2 −.1 .7 .5 .9 .9 .5 .3 .2
−.7 .5 −.4 .2 −.7 −.7 −.6 −.2 −.2 −.7 −.8 −1.5 −1.6

SATOBS : RMS O−B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
NOVEMBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



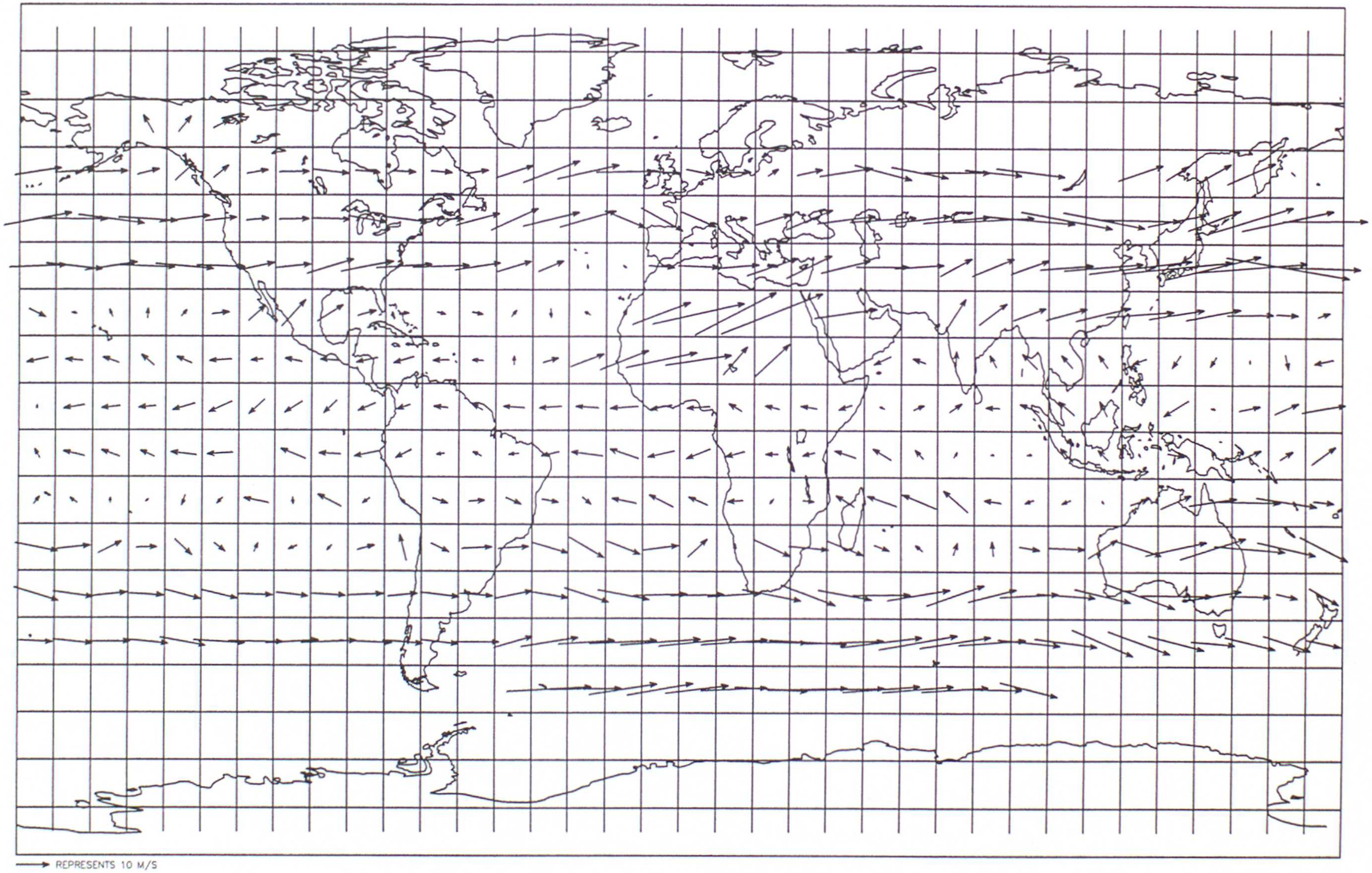
AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
NOVEMBER 1998



		0	4	6	5	1		1	0	8	5	1																							
13	33	53	83	82	46	43	55	38	44	47	36	30	20	7	2	3	3	3	3	2	2	2	2	2	3	2	1			0	1	1			
32	31	49	87	107	89	63	54	51	[illegible]	37	38	32	25	27	9	4	3	3	3	5	6	4	6	6	5	2	1	3	8	9	8	9	8	6	8
18	28	30	51	45	35	22	26	28	20	29	66	57	35	23	37	11	4	5	7	8	4	3	2	2	2	4	4	9	7	4		1	2	2	8
28	26	36	73	84	65	10	8	27	18	16	24	15	14	24	24	4	2	2	2	2	1	1	1	0	2	6	8	9	6	2	2	2	1	1	12
22	30	20	39	71	49	16	16	24	39	24	34	25	14	12	8	3	1	0	3	1	1	1	4	3	6	5	7	5	4	1	2	2	2	2	4
7	8	12	13	22	36	25	31	20	32	27	13	19	41	41	4	7	5	3	3	4	5	6	5	7	8	5	7	7	4	1	1	2	3	4	3
7	7	9	7	3	3	1	6	10	30	33	7	7	8	7	2	2	2	8	3	2	2	8	11	4	10	7	7	5	3	1	0	1	1	2	3
7	12	19	23	36	50	52	95	70	50	9	9	4	9	11	5	22	61	35	6	3	2	2	22	22	22	10	14	13	4	2	1		1	1	2
18	19	36	29	35	41	59	127	171	113	15	12	12	24	15	18	10	23	34	7	2	1	3	6	11	20	23	23	19	4	6	2	3	3	4	15
45	63	84	76	56	89	113	76	98	96	36	17	31	47	50	31	6	10	15	8	6	6	8	9	12	18	18	19	15	6	6	4	5	6	9	10
19	22	24	21	14	21	52	53	59	56	38	21	34	52	44	28	10	13	16	20	26	25	15	13	14	15	18	11	7	8	14	13	10	9	8	9
														1	2	6	12	11	9	6	7	7	11	9	8	5	2								

SATOB VECTOR MEAN WINDS BETWEEN 401-700 HPA
NOVEMBER 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

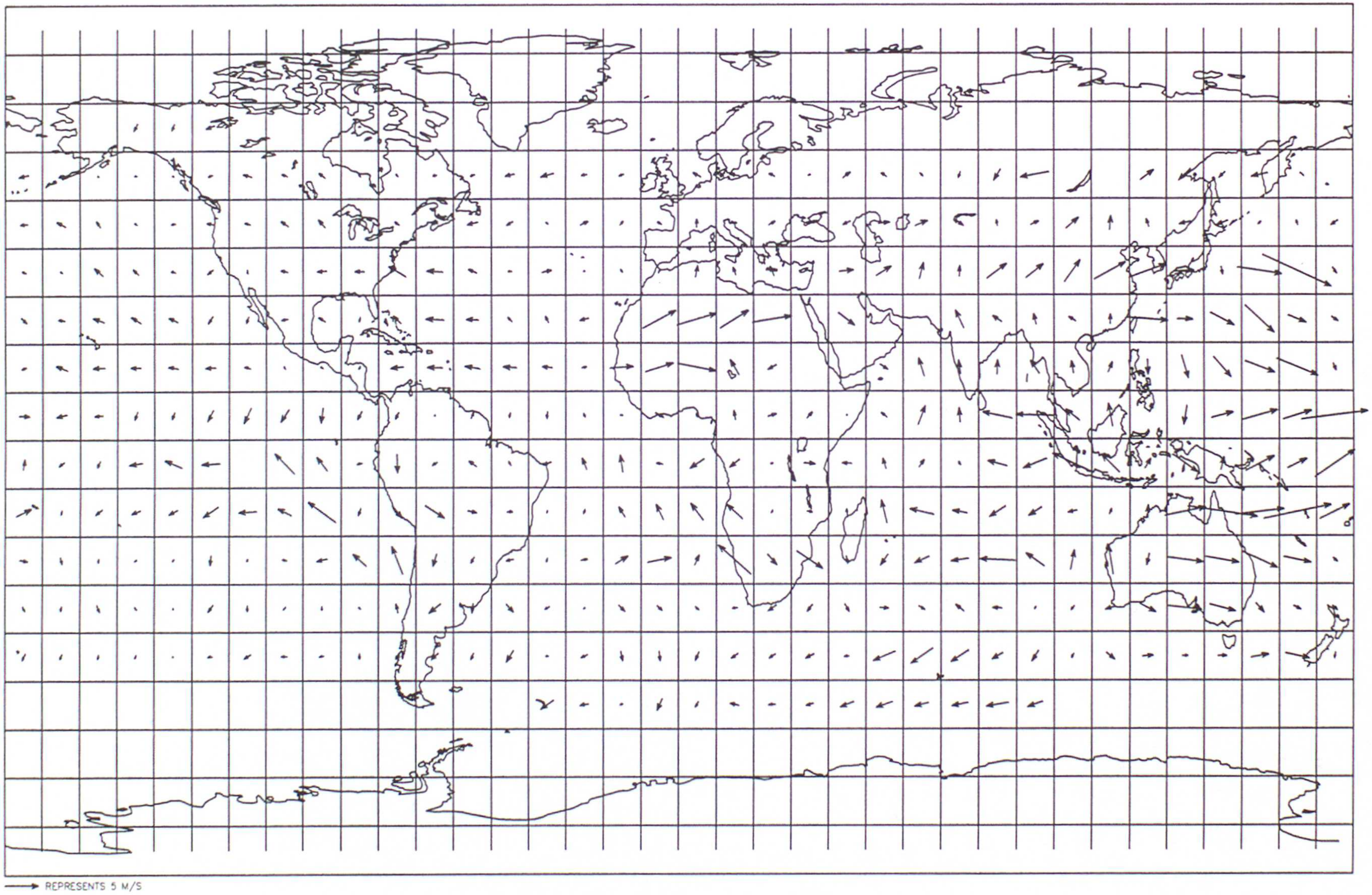
FIGURE 16


REPRESENTS 10 M/S

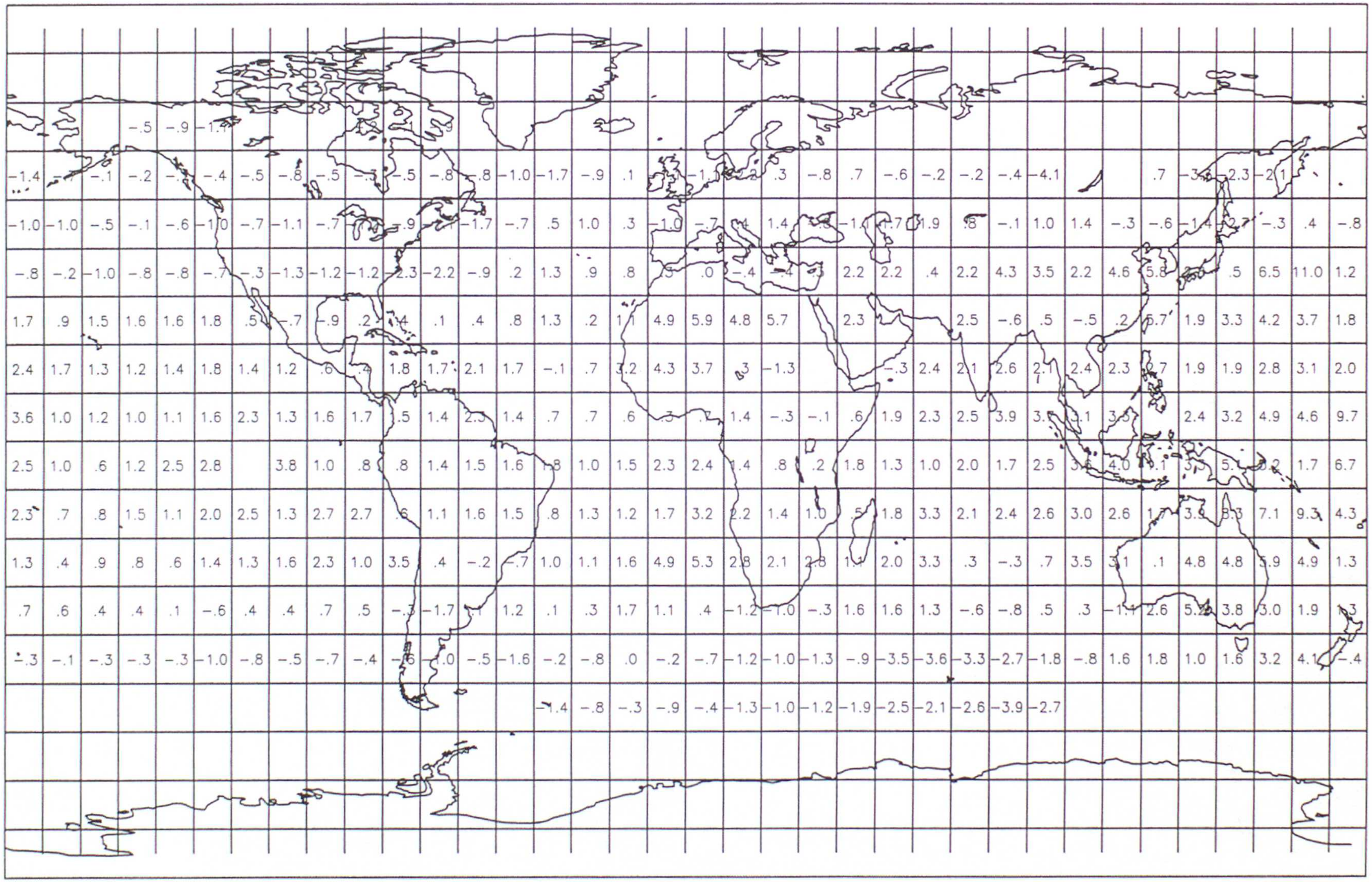
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA

FIGURE 17

NOVEMBER 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

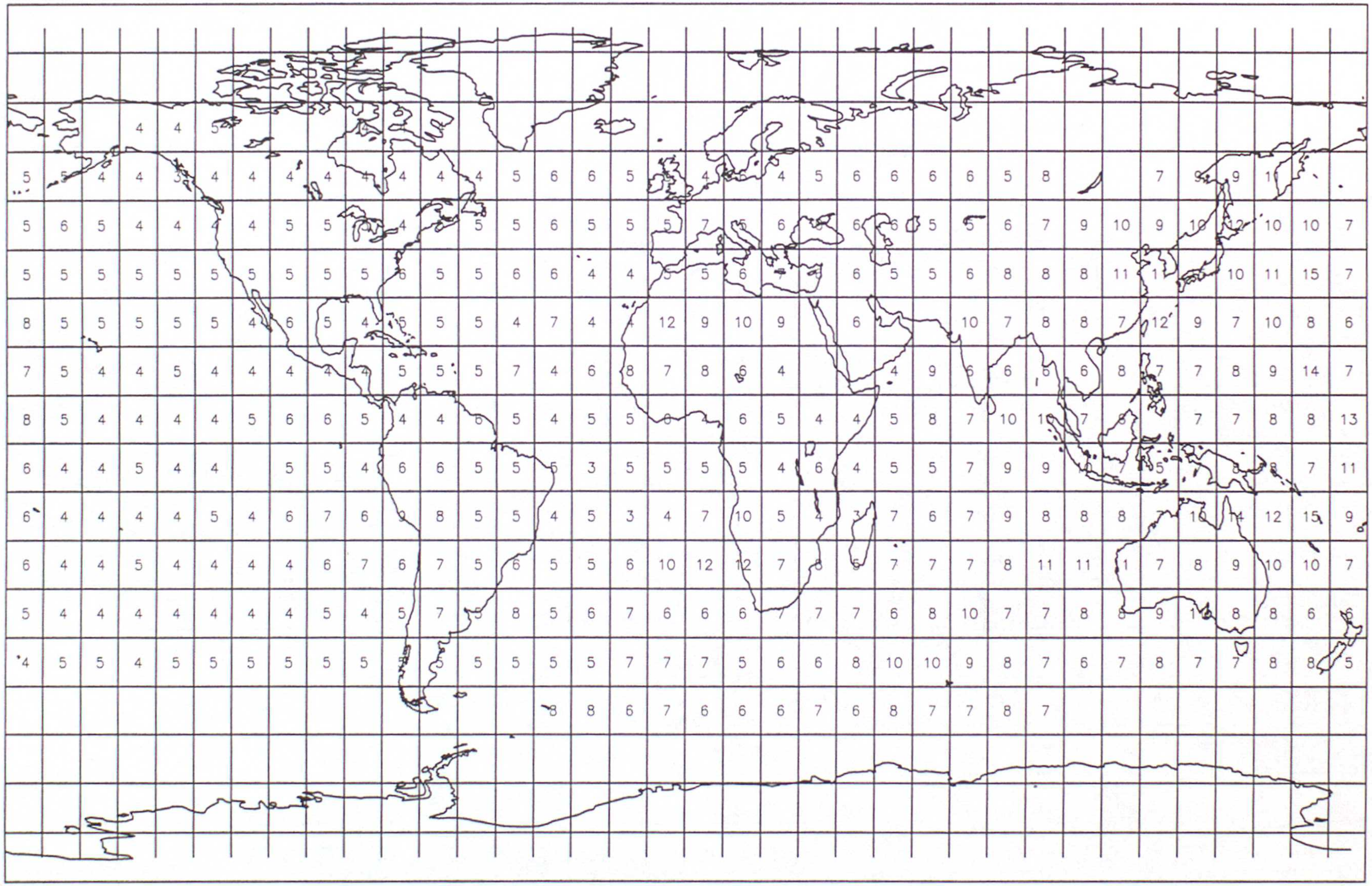


SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
NOVEMBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

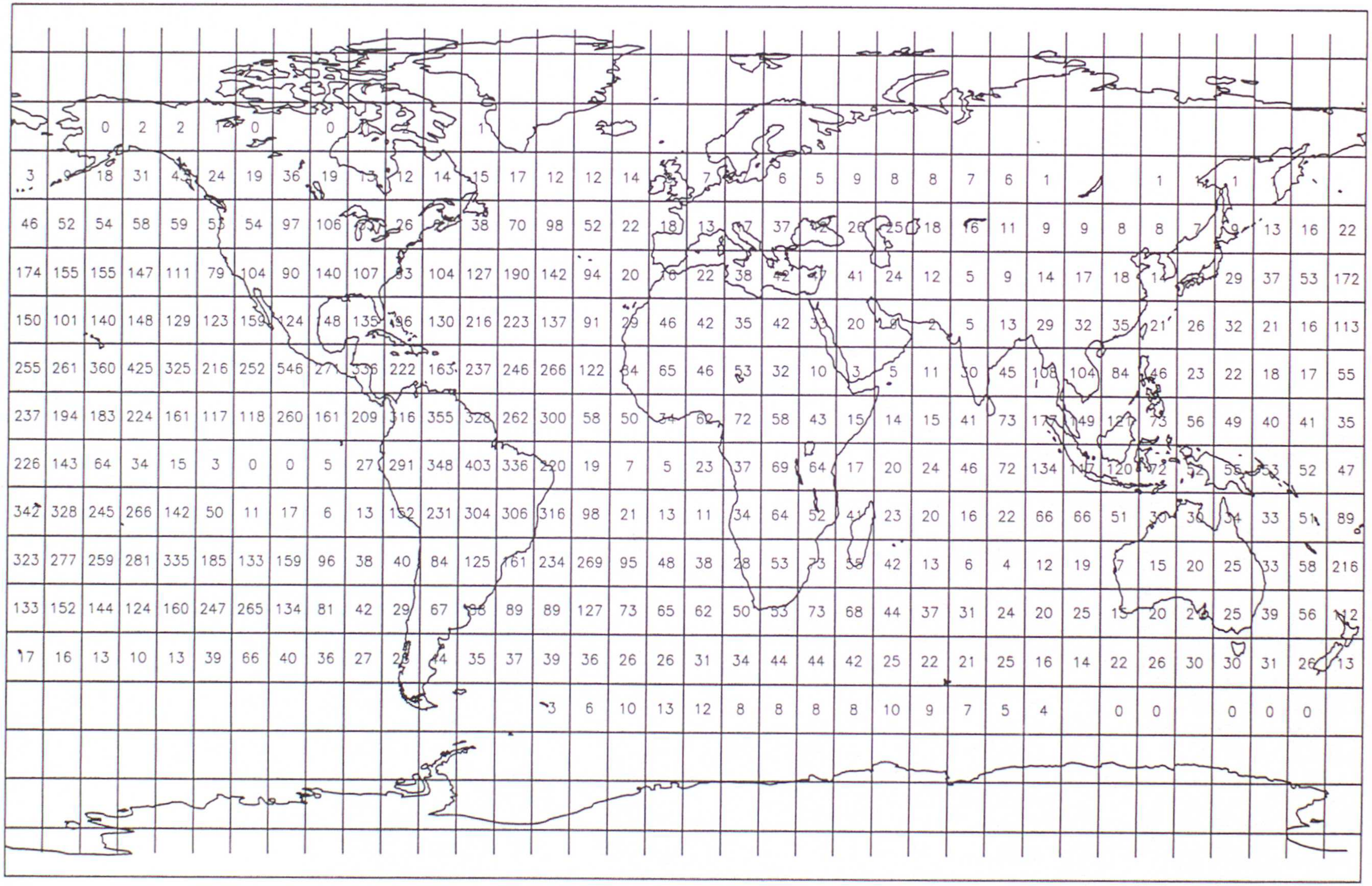


-.5 -.9 -1.1
-1.4 -.7 -.1 -.2 -.4 -.5 -.8 -.5 -.3 -.5 -.8 -.8 -1.0 -1.7 -.9 .1 -1.1 .3 -.8 .7 -.6 -.2 -.2 -.4 -4.1 .7 -2.3 -2.1
-1.0 -1.0 -.5 -.1 -.6 -1.0 -.7 -1.1 -.7 -.9 -1.7 -.7 .5 1.0 .3 -1.0 -.7 .4 1.4 -1.1 -1.7 1.9 .8 -.1 1.0 1.4 -.3 -.6 -1.4 -2.7 -.3 .4 -.8
-.8 -.2 -1.0 -.8 -.8 -.7 -.3 -1.3 -1.2 -1.2 -2.3 -2.2 -.9 .2 1.3 .9 .8 .0 -.4 -.4 2.2 2.2 .4 2.2 4.3 3.5 2.2 4.6 5.8 .5 6.5 11.0 1.2
1.7 .9 1.5 1.6 1.6 1.8 .5 -.7 -.9 .2 .4 .1 .4 .8 1.3 .2 1.1 4.9 5.9 4.8 5.7 2.3 2.5 -.6 .5 -.5 .2 5.7 1.9 3.3 4.2 3.7 1.8
2.4 1.7 1.3 1.2 1.4 1.8 1.4 1.2 .6 .4 1.8 1.7 2.1 1.7 -.1 .7 3.2 4.3 3.7 .3 -1.3 -.3 2.4 2.1 2.6 2.1 2.4 2.3 .7 1.9 1.9 2.8 3.1 2.0
3.6 1.0 1.2 1.0 1.1 1.6 2.3 1.3 1.6 1.7 .5 1.4 2.3 1.4 .7 .7 .6 .3 .7 1.4 -.3 -.1 .6 1.9 2.3 2.5 3.9 3.7 3.1 3.5 2.4 3.2 4.9 4.6 9.7
2.5 1.0 .6 1.2 2.5 2.8 3.8 1.0 .8 .8 1.4 1.5 1.6 1.8 1.0 1.5 2.3 2.4 1.4 .8 .2 1.8 1.3 1.0 2.0 1.7 2.5 3.6 4.0 .1 3.5 5.1 3.2 1.7 6.7
2.3 .7 .8 1.5 1.1 2.0 2.5 1.3 2.7 2.7 .6 1.1 1.6 1.5 .8 1.3 1.2 1.7 3.2 2.2 1.4 1.0 .5 1.8 3.3 2.1 2.4 2.6 3.0 2.6 1.7 3.9 3.3 7.1 9.3 4.3
1.3 .4 .9 .8 .6 1.4 1.3 1.6 2.3 1.0 3.5 .4 -.2 -.7 1.0 1.1 1.6 4.9 5.3 2.8 2.1 2.8 1.1 2.0 3.3 .3 -.3 .7 3.5 3.1 .1 4.8 4.8 5.9 4.9 1.3
.7 .6 .4 .4 .1 -.6 .4 .4 .7 .5 -.3 -1.7 .1 1.2 .1 .3 1.7 1.1 .4 -1.2 -1.0 -.3 1.6 1.6 1.3 -.6 -.8 .5 .3 -1.1 2.6 5.2 3.8 3.0 1.9 1.3
-.3 -.1 -.3 -.3 -.3 -1.0 -.8 -.5 -.7 -.4 -.6 -1.0 -.5 -1.6 -.2 -.8 .0 -.2 -.7 -1.2 -1.0 -1.3 -.9 -3.5 -3.6 -3.3 -2.7 -1.8 -.8 1.6 1.8 1.0 1.6 3.2 4.1 -.4
-1.4 -.8 -.3 -.9 -.4 -1.3 -1.0 -1.2 -1.9 -2.5 -2.1 -2.6 -3.9 -2.7

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
NOVEMBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



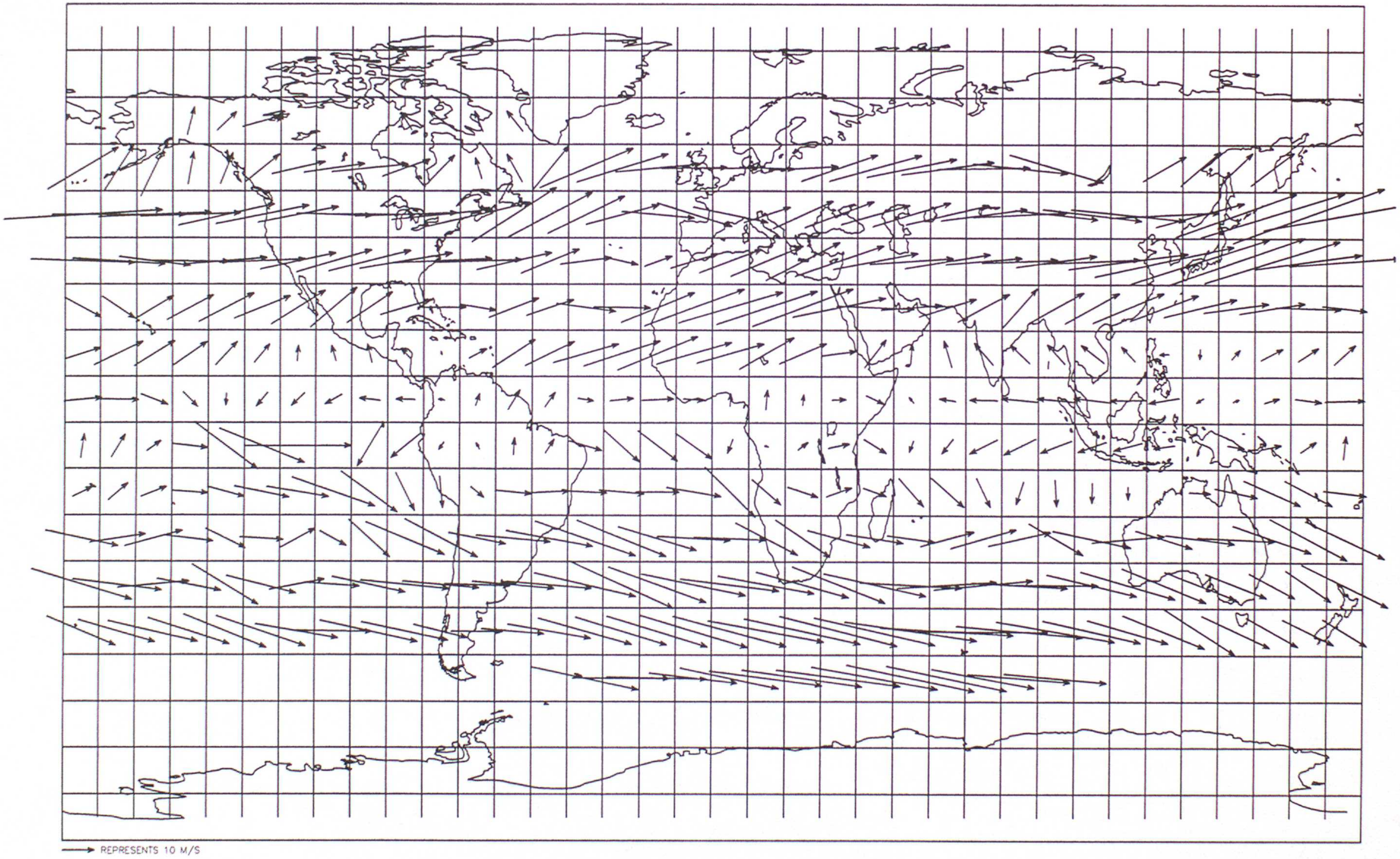
AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
NOVEMBER 1998



		0	2	2	1	0		0	[illegible]	[illegible]		1																							
3	9	18	31	43	24	19	36	19	13	12	14	15	17	12	12	14	8	7	7	6	5	9	8	8	7	6	1			1	1	1			
46	52	54	58	59	53	54	97	106	[illegible]	26	[illegible]	38	70	98	52	22	18	13	17	37	42	26	25	18	16	11	9	9	8	8	7	9	13	16	22
174	155	155	147	111	79	104	90	140	107	83	104	127	190	142	94	20	16	22	38	42	47	41	24	12	5	9	14	17	18	14		29	37	53	172
150	101	140	148	129	123	159	124	148	135	96	130	216	223	137	91	29	46	42	35	42	33	20	8	2	5	13	29	32	35	21	26	32	21	16	113
255	261	360	425	325	216	252	546	271	336	222	163	237	246	266	122	34	65	46	53	32	10	3	5	11	30	45	108	104	84	46	23	22	18	17	55
237	194	183	224	161	117	118	260	161	209	316	355	328	262	300	58	50	34	62	72	58	43	15	14	15	41	73	177	149	121	73	56	49	40	41	35
226	143	64	34	15	3	0	0	5	27	291	348	403	336	220	19	7	5	23	37	69	64	17	20	24	46	72	134	117	120	72	52	55	53	52	47
342	328	245	266	142	50	11	17	6	13	152	231	304	306	316	98	21	13	11	34	64	52	41	23	20	16	22	66	66	51	30	30	34	33	51	89
323	277	259	281	335	185	133	159	96	38	40	84	125	161	234	269	95	48	38	28	53	73	55	42	13	6	4	12	19	7	15	20	25	33	58	216
133	152	144	124	160	247	265	134	81	42	29	67	88	89	89	127	73	65	62	50	53	73	68	44	37	31	24	20	25	15	20	24	25	39	56	112
17	16	13	10	13	39	66	40	36	27	28	44	35	37	39	36	26	26	31	34	44	44	42	25	22	21	25	16	14	22	26	30	30	31	26	13
														3	6	10	13	12	8	8	8	8	10	9	7	5	4		0	0		0	0	0	

SATOB VECTOR MEAN WINDS BETWEEN 101–400 HPA
NOVEMBER 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 21


REPRESENTS 10 M/S

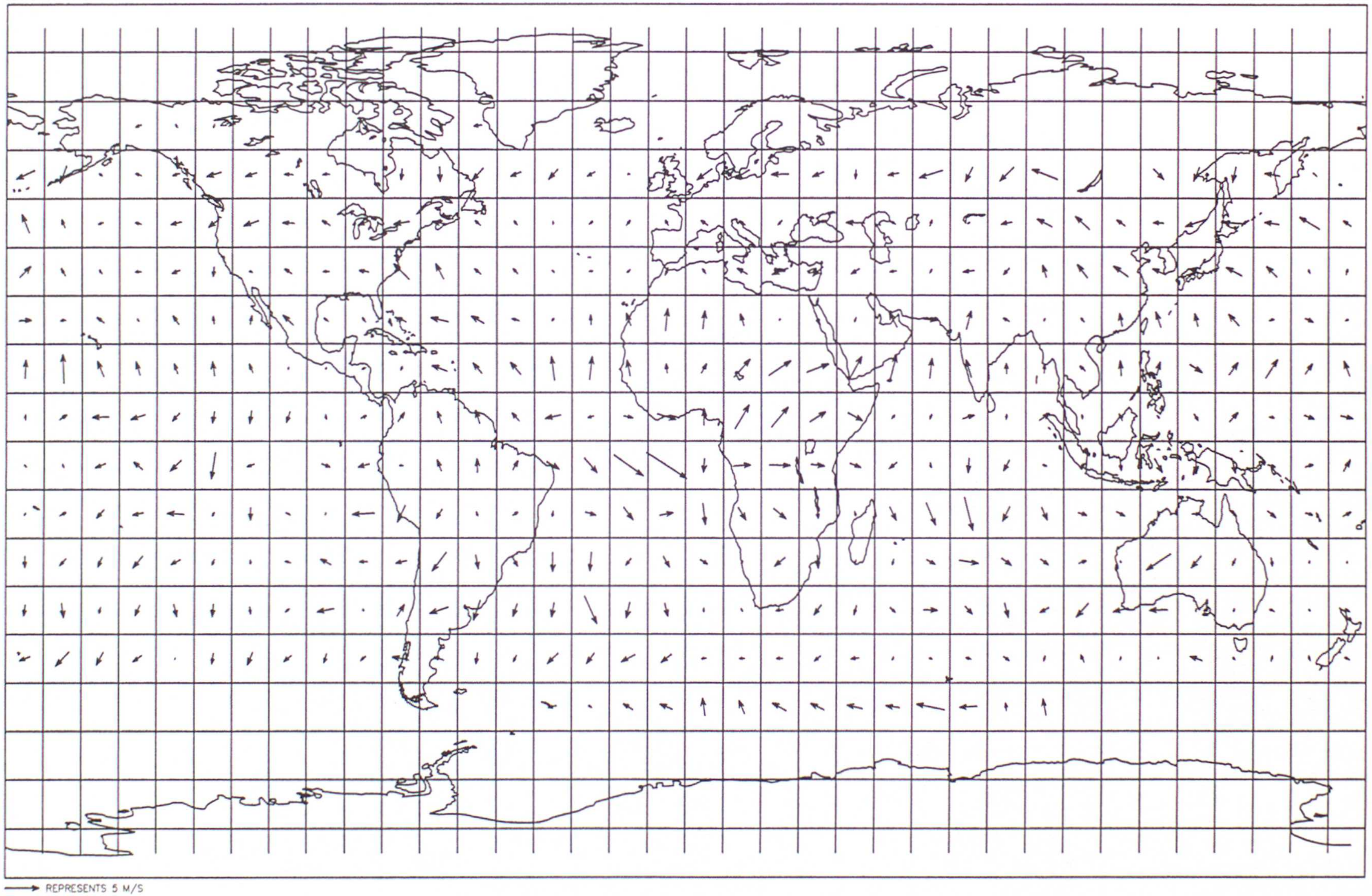
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101–400 HPA

NOVEMBER 1998

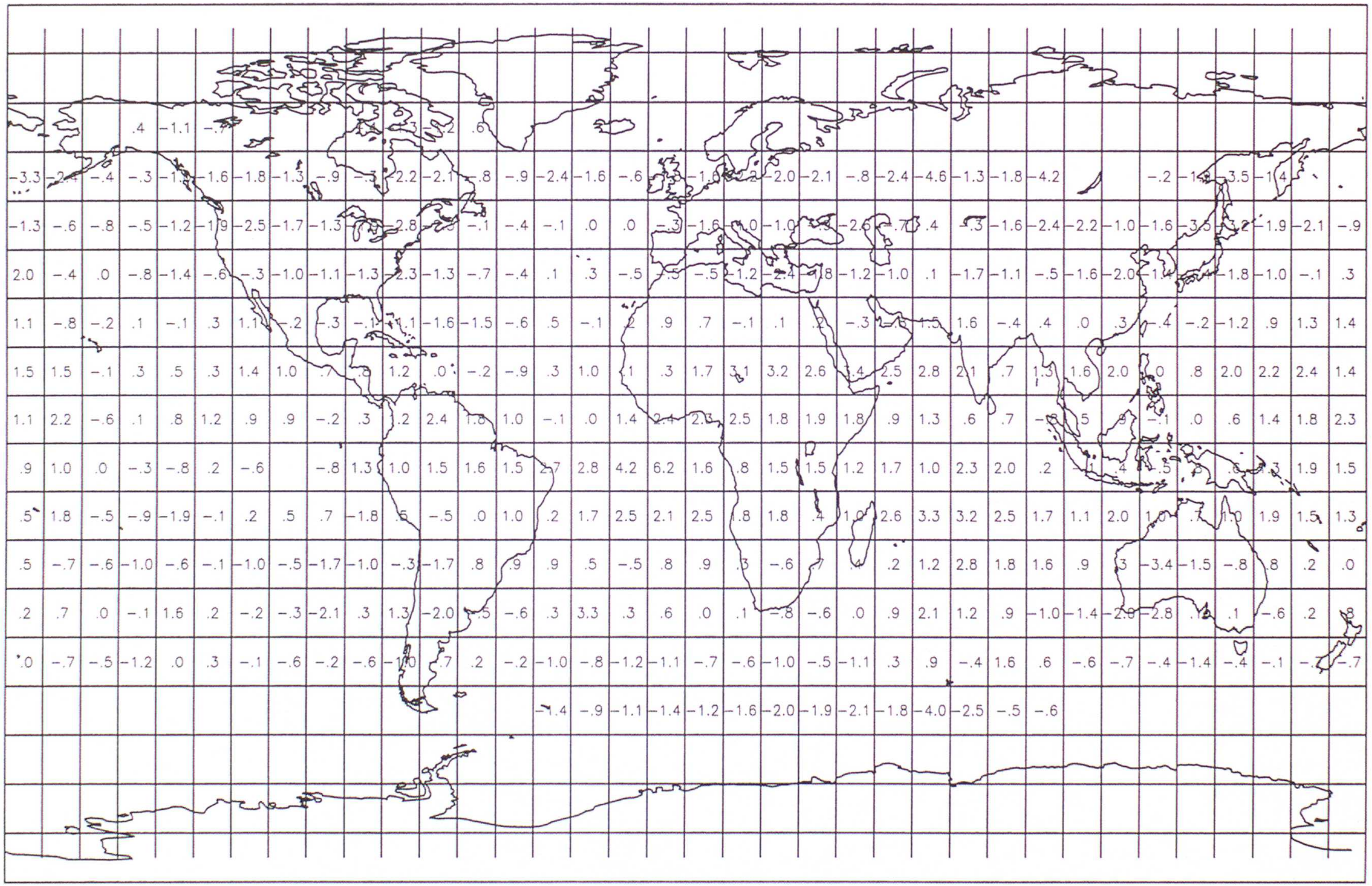
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

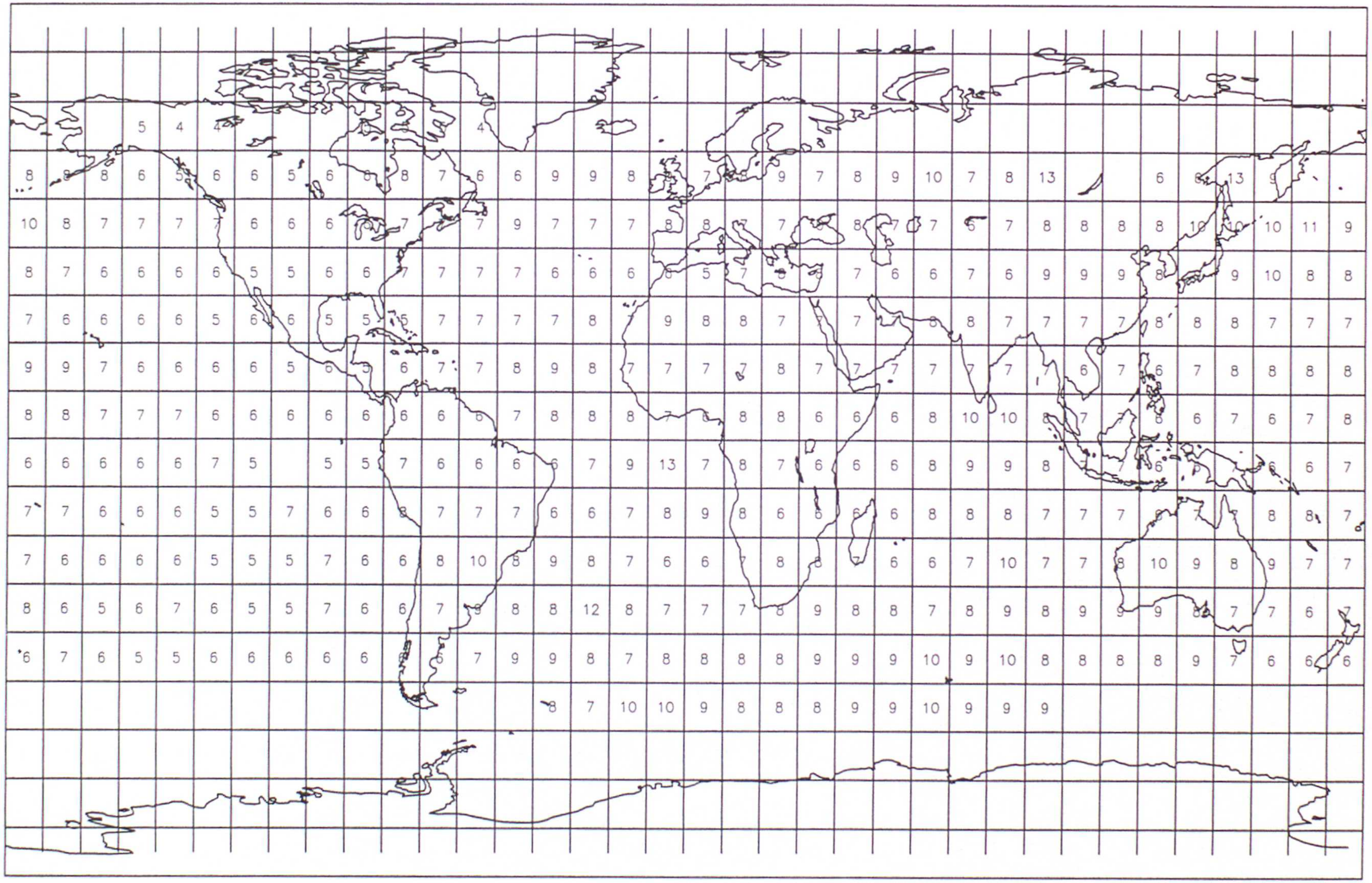
FIGURE 22



SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
NOVEMBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


.4 -1.1 -.7 -1.4 -1.3 -1.2 .6
-3.3 -2.4 -.4 -.3 -1.2 -1.6 -1.8 -1.3 -.9 -.3 -2.2 -2.1 -.8 -.9 -2.4 -1.6 -.6 -1.3 -1.6 -2.2 -2.0 -2.1 -.8 -2.4 -4.6 -1.3 -1.8 -4.2 -.2 -1.8 -3.5 -1.4
-1.3 -.6 -.8 -.5 -1.2 -1.9 -2.5 -1.7 -1.3 -1.0 -2.8 -2.5 -.1 -.4 -.1 .0 .0 -.3 -1.6 -1.0 -1.0 -1.3 -2.6 -.7 .4 -.3 -1.6 -2.4 -2.2 -1.0 -1.6 -3.5 -3.2 -1.9 -2.1 -.9
2.0 -.4 .0 -.8 -1.4 -.6 -.3 -1.0 -1.1 -1.3 -2.3 -1.3 -.7 -.4 .1 .3 -.5 -.5 -.5 -1.2 -2.4 -1.8 -1.2 -1.0 .1 -1.7 -1.1 -.5 -1.6 -2.0 -1.4 -1.4 -1.8 -1.0 -.1 .3
1.1 -.8 -.2 .1 -.1 .3 1.1 -.2 -.3 -.1 -1.1 -1.6 -1.5 -.6 .5 -.1 .2 .9 .7 -.1 .1 .2 -.3 -.6 1.5 1.6 -.4 .4 .0 .3 -.4 -.2 -1.2 .9 1.3 1.4
1.5 1.5 -.1 .3 .5 .3 1.4 1.0 .7 .8 1.2 .0 -.2 -.9 .3 1.0 .1 .3 1.7 3.1 3.2 2.6 3.4 2.5 2.8 2.1 .7 1.3 1.6 2.0 .0 .8 2.0 2.2 2.4 1.4
1.1 2.2 -.6 .1 .8 1.2 .9 .9 -.2 .3 1.2 2.4 1.8 1.0 -.1 .0 1.4 2.4 2.3 2.5 1.8 1.9 1.8 .9 1.3 .6 .7 -.8 .5 .9 -.1 .0 .6 1.4 1.8 2.3
.9 1.0 .0 -.3 -.8 .2 -.6 -.8 1.3 1.0 1.5 1.6 1.5 2.7 2.8 4.2 6.2 1.6 .8 1.5 1.5 1.2 1.7 1.0 2.3 2.0 .2 -.1 .4 -.5 .5 .6 1.3 1.9 1.5
.5 1.8 -.5 -.9 -1.9 -.1 .2 .5 .7 -1.8 .5 -.5 .0 1.0 .2 1.7 2.5 2.1 2.5 1.8 1.8 .4 1.0 2.6 3.3 3.2 2.5 1.7 1.1 2.0 1.0 .7 1.0 1.9 1.5 1.3
.5 -.7 -.6 -1.0 -.6 -.1 -1.0 -.5 -1.7 -1.0 -.3 -1.7 .8 .9 .9 .5 -.5 .8 .9 .3 -.6 .7 .4 .2 1.2 2.8 1.8 1.6 .9 .3 -3.4 -1.5 -.8 .8 .2 .0
.2 .7 .0 -.1 1.6 .2 -.2 -.3 -2.1 .3 1.3 -2.0 -.5 -.6 .3 3.3 .3 .6 .0 .1 -.8 -.6 .0 .9 2.1 1.2 .9 -1.0 -1.4 -2.0 -2.8 .1 .1 -.6 .2 .8
.0 -.7 -.5 -1.2 .0 .3 -.1 -.6 -.2 -.6 -1.0 .7 .2 -.2 -1.0 -.8 -1.2 -1.1 -.7 -.6 -1.0 -.5 -1.1 .3 .9 -.4 1.6 .6 -.6 -.7 -.4 -1.4 -.4 -.1 -.7 -.7
-1.4 -.9 -1.1 -1.4 -1.2 -1.6 -2.0 -1.9 -2.1 -1.8 -4.0 -2.5 -.5 -.6

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
NOVEMBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: November 1998

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from NOAA-11, NOAA-14 500 km.
Standard of comparison	:Background field from Bracknell global model.
Selection Criteria	:All SATEM soundings where number of observations > 30.
Data Extracted	:Layer: 850 - 1000 hPa 100 - 300 hPa 30 - 50 hPa :Mean observation minus background temperature differences

NO DATA AVAILABLE

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed ($m\ s^{-1}$) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 $m\ s^{-1}$ (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13501	10.3	-21.1	ALL	P	SUR	232	0	0	0.8	-0.7	1.0
13503	19.2	-58.1	ALL	P	SUR	248	0	0	0.9	-0.5	1.0
13906	25.1	-50.1	ALL	P	SUR	217	0	0	0.9	-0.2	0.9
13913	14.7	-61.2	ALL	P	SUR	74	0	0	1.6	-0.1	1.6
29811	47.2	-21.8	ALL	P	SUR	3	0	0	0.7	-2.5	2.6
33503	44.7	-64.1	ALL	P	SUR	58	0	0	2.4	-4.6	5.2
41502	21.1	-44.7	ALL	P	SUR	211	0	0	0.7	-0.2	0.8
41503	22.2	-57.3	ALL	P	SUR	252	0	0	0.8	-0.2	0.8
41504	26.0	-64.9	ALL	P	SUR	276	0	0	0.9	0.0	0.9
41505	29.6	-63.4	ALL	P	SUR	281	0	0	0.8	0.1	0.9
41520	22.6	-45.1	ALL	P	SUR	234	0	0	0.7	0.4	0.8
41521	27.2	-57.3	ALL	P	SUR	281	0	0	0.8	0.0	0.8
41528	28.9	-67.2	ALL	P	SUR	281	0	0	0.9	0.2	1.0
41597	31.1	-27.4	ALL	P	SUR	586	0	0	0.8	-0.3	0.8
41598	26.5	-44.3	ALL	P	SUR	1414	3	0	1.1	0.3	1.2
41599	24.5	-39.1	ALL	P	SUR	564	0	0	0.9	-0.6	1.0
41625	29.3	-68.2	ALL	P	SUR	277	0	0	1.0	0.2	1.0
41626	24.3	-74.2	ALL	P	SUR	262	0	0	1.0	0.1	1.0
41629	28.6	-69.2	ALL	P	SUR	284	0	0	1.0	0.1	1.0
41633	13.7	-57.7	ALL	P	SUR	345	10	3	1.3	0.4	1.3
41636	16.3	-51.2	ALL	P	SUR	612	21	3	1.0	0.0	1.0
41637	23.6	-46.4	ALL	P	SUR	258	3	1	0.8	-0.1	0.8
41638	18.1	-60.1	ALL	P	SUR	423	0	0	1.3	0.2	1.3
44601	53.1	-42.4	ALL	P	SUR	769	78	10	2.1	0.3	2.1
44602	52.9	-28.3	ALL	P	SUR	717	29	4	1.9	0.6	2.0
44603	51.2	-35.9	ALL	P	SUR	788	0	0	2.1	-0.6	2.2
44604	45.0	-32.8	ALL	P	SUR	566	1	0	1.9	0.0	1.9
44606	53.2	-37.1	ALL	P	SUR	1047	2	0	2.6	1.1	2.8
44613	42.6	-30.3	ALL	P	SUR	773	1	0	1.4	-0.1	1.4
44617	56.4	-6.2	ALL	P	SUR	95	0	0	1.4	-0.2	1.4
44726	55.2	-31.6	ALL	P	SUR	979	4	0	2.2	-0.1	2.2
44742	46.5	-16.2	ALL	P	SUR	864	8	1	1.3	0.0	1.3
44743	44.1	-50.6	ALL	P	SUR	753	2	0	1.4	-0.9	1.7
44760	52.2	-39.1	ALL	P	SUR	796	58	7	2.0	-0.7	2.2
44762	44.3	-53.4	ALL	P	SUR	497	0	0	1.4	-0.1	1.4
44764	51.0	-45.8	ALL	P	SUR	604	5	1	1.9	-0.8	2.0
44768	58.6	-8.3	ALL	P	SUR	1357	9	1	1.9	0.2	1.9
44770	55.9	-37.5	ALL	P	SUR	810	2	0	1.6	-0.9	1.9
44772	49.9	-31.7	ALL	P	SUR	1021	3	0	2.4	-0.3	2.4
44773	57.1	-7.4	ALL	P	SUR	118	0	0	1.1	-0.5	1.2
44774	51.7	-21.1	ALL	P	SUR	1020	6	1	1.9	-0.6	2.0
44775	55.5	-28.4	ALL	P	SUR	1203	4	0	2.2	0.1	2.2
44778	50.4	-50.5	ALL	P	SUR	878	1	0	1.7	-0.7	1.8
44779	45.9	-33.7	ALL	P	SUR	883	6	1	1.9	-0.2	1.9
44780	59.4	-6.1	ALL	P	SUR	1344	4	0	1.6	0.4	1.6
44901	55.0	-42.2	ALL	P	SUR	133	0	0	1.3	0.1	1.3
44912	52.4	-17.9	ALL	P	SUR	110	0	0	1.1	0.8	1.4
44925	53.5	-45.8	ALL	P	SUR	113	1	1	4.2	0.7	4.3
47556	73.8	-76.7	ALL	P	SUR	695	0	0	1.2	-0.8	1.4
48518	68.8	-25.5	ALL	P	SUR	422	0	0	1.4	-0.5	1.4
59811	39.8	-68.1	ALL	P	SUR	6	0	0	0.7	-2.1	2.3
61521	36.0	-4.1	ALL	P	SUR	636	0	0	1.0	-0.4	1.1
62506	45.6	-4.2	ALL	P	SUR	167	0	0	1.0	0.0	1.0
62511	46.4	-17.3	ALL	P	SUR	745	37	5	1.3	0.4	1.3
62512	46.2	-17.2	ALL	P	SUR	205	0	0	1.3	0.3	1.3
62513	47.7	-16.0	ALL	P	SUR	745	4	1	1.1	0.2	1.1
62515	57.2	-28.4	ALL	P	SUR	1804	1	0	2.2	0.3	2.3
62517	50.1	-16.5	ALL	P	SUR	766	5	1	3.1	2.0	3.7
62519	42.6	-21.8	ALL	P	SUR	1135	3	0	1.1	0.1	1.1
62520	44.3	-18.8	ALL	P	SUR	684	0	0	1.0	-0.2	1.0

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
62554	46.2	-16.6	ALL	P	SUR	697	0	0	1.1	0.3	1.1
62674	63.4	-20.3	ALL	P	SUR	279	1	0	2.1	0.3	2.1
64528	59.7	-14.5	ALL	P	SUR	1618	4	0	1.5	-0.2	1.5
64529	59.6	-34.1	ALL	P	SUR	1156	11	1	2.2	-0.9	2.4
64561	47.7	-3.4	ALL	P	SUR	94	0	0	3.2	-1.2	3.4
64563	58.6	-18.0	ALL	P	SUR	144	8	6	2.7	-0.6	2.7
65571	59.8	-21.8	ALL	P	SUR	1421	6	0	2.2	-0.2	2.2
65581	56.3	-32.1	ALL	P	SUR	656	0	0	2.3	-0.9	2.5
65591	55.4	-40.8	ALL	P	SUR	852	4	0	1.9	-0.8	2.0
65592	62.2	-37.5	ALL	P	SUR	1529	7	0	1.9	-0.7	2.0
65597	51.6	-15.9	ALL	P	SUR	1169	18	2	2.2	-0.5	2.2
65599	60.8	-32.0	ALL	P	SUR	1294	4	0	1.9	0.1	1.9
WIND SPEED											
13501	10.3	-21.1	ALL	SPEED	SUR	254	0	0	1.6	-1.4	2.2
13503	19.2	-58.1	ALL	SPEED	SUR	344	0	0	1.6	-1.9	2.5
29811	47.2	-21.8	ALL	SPEED	SUR	3	0	0	1.0	-0.3	1.1
41504	26.0	-64.9	ALL	SPEED	SUR	374	0	0	1.7	0.4	1.7
41520	22.6	-45.1	ALL	SPEED	SUR	350	0	0	2.9	3.3	4.4
41521	27.2	-57.3	ALL	SPEED	SUR	412	0	0	1.8	-0.1	1.8
41522	14.3	-67.6	ALL	SPEED	SUR	267	0	0	3.2	-3.0	4.4
41598	26.5	-44.3	ALL	SPEED	SUR	122	3	2	2.5	-0.1	2.5
41599	24.5	-39.1	ALL	SPEED	SUR	599	0	0	2.4	0.4	2.4
41625	29.3	-68.2	ALL	SPEED	SUR	414	0	0	1.8	-0.1	1.8
41626	24.3	-74.2	ALL	SPEED	SUR	318	0	0	2.2	-1.8	2.8
41629	28.6	-69.2	ALL	SPEED	SUR	442	0	0	1.5	-0.6	1.7
41633	13.7	-57.7	ALL	SPEED	SUR	267	0	0	1.5	-0.5	1.6
41635	26.0	-52.8	ALL	SPEED	SUR	206	0	0	0.0	1.3	1.3
41636	16.3	-51.2	ALL	SPEED	SUR	465	1	0	1.2	-1.1	1.6
41637	23.6	-46.4	ALL	SPEED	SUR	272	0	0	2.1	1.0	2.3
41638	18.1	-60.1	ALL	SPEED	SUR	327	0	0	2.4	-0.1	2.4
44601	53.1	-42.4	ALL	SPEED	SUR	470	3	1	3.1	0.8	3.2
44602	52.9	-28.3	ALL	SPEED	SUR	433	1	0	3.1	0.2	3.1
44613	42.6	-30.3	ALL	SPEED	SUR	2	0	0	13.1	26.5	29.5
44762	44.3	-53.4	ALL	SPEED	SUR	596	1	0	3.1	3.7	4.9
44772	49.9	-31.7	ALL	SPEED	SUR	2	0	0	0.1	-5.8	5.8
44773	57.1	-7.4	ALL	SPEED	SUR	45	0	0	3.2	-6.8	7.5
44779	45.9	-33.7	ALL	SPEED	SUR	1	0	0	0.0	-14.7	14.7
44780	59.4	-6.1	ALL	SPEED	SUR	1	0	0	0.0	17.2	17.2
59811	39.8	-68.1	ALL	SPEED	SUR	7	0	0	2.3	0.1	2.3
62511	46.4	-17.3	ALL	SPEED	SUR	1	0	0	0.0	1.3	1.3
62513	47.7	-16.0	ALL	SPEED	SUR	2	0	0	2.6	3.9	4.7
62517	50.1	-16.5	ALL	SPEED	SUR	878	0	0	1.9	-0.8	2.1
62518	44.1	-15.8	ALL	SPEED	SUR	3	0	0	0.0	1.3	1.3
62519	42.6	-21.8	ALL	SPEED	SUR	1	1	100	0.0	0.0	0.0
64529	59.6	-34.1	ALL	SPEED	SUR	1	0	0	0.0	1.3	1.3
65581	56.3	-32.1	ALL	SPEED	SUR	1	0	0	0.0	21.7	21.7
65599	60.8	-32.0	ALL	SPEED	SUR	1545	1	0	2.9	-0.5	2.9
WIND DIRECTION											
13501	10.3	-21.1	ALL	DIRN.	SUR	121	0	0	54.9	-20.5	58.6
13503	19.2	-58.1	ALL	DIRN.	SUR	146	0	0	21.8	13.8	25.9
29811	47.2	-21.8	ALL	DIRN.	SUR	3	0	0	8.1	5.5	9.8
41501	18.9	-49.3	ALL	DIRN.	SUR	1	0	0	0.0	2.5	2.5
41502	21.1	-44.7	ALL	DIRN.	SUR	204	0	0	26.0	10.8	28.2
41503	22.2	-57.3	ALL	DIRN.	SUR	247	0	0	45.6	25.7	52.3
41504	26.0	-64.9	ALL	DIRN.	SUR	166	0	0	15.9	14.1	21.3
41520	22.6	-45.1	ALL	DIRN.	SUR	109	0	0	25.6	-0.9	25.6
41521	27.2	-57.3	ALL	DIRN.	SUR	140	0	0	26.4	-6.8	27.2
41522	14.3	-67.6	ALL	DIRN.	SUR	86	0	0	23.4	-3.6	23.7

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND DIRECTION											
41523	18.9	-61.3	ALL	DIRN.	SUR	222	0	0	0.0	2.5	2.5
41598	26.5	-44.3	ALL	DIRN.	SUR	996	3	0	34.6	-2.3	34.6
41599	24.5	-39.1	ALL	DIRN.	SUR	189	0	0	24.6	-0.5	24.6
41625	29.3	-68.2	ALL	DIRN.	SUR	118	0	0	26.7	-0.5	26.7
41626	24.3	-74.2	ALL	DIRN.	SUR	188	0	0	18.2	6.0	19.1
41629	28.6	-69.2	ALL	DIRN.	SUR	112	0	0	37.5	-0.9	37.5
41633	13.7	-57.7	ALL	DIRN.	SUR	250	0	0	17.0	17.9	24.7
41636	16.3	-51.2	ALL	DIRN.	SUR	392	1	0	16.9	13.9	21.9
41637	23.6	-46.4	ALL	DIRN.	SUR	92	0	0	22.4	-1.7	22.5
41638	18.1	-60.1	ALL	DIRN.	SUR	221	0	0	23.4	14.7	27.6
44601	53.1	-42.4	ALL	DIRN.	SUR	445	3	1	33.3	-4.8	33.6
44602	52.9	-28.3	ALL	DIRN.	SUR	405	1	0	29.4	-1.0	29.4
44762	44.3	-53.4	ALL	DIRN.	SUR	375	1	0	24.2	-11.7	26.9
44773	57.1	-7.4	ALL	DIRN.	SUR	31	0	0	49.4	100.6	112.0
59811	39.8	-68.1	ALL	DIRN.	SUR	3	0	0	5.6	-10.5	11.9
62513	47.7	-16.0	ALL	DIRN.	SUR	1	0	0	0.0	-136.2	136.2
62517	50.1	-16.5	ALL	DIRN.	SUR	614	0	0	17.7	2.0	17.8
62519	42.6	-21.8	ALL	DIRN.	SUR	1	1	100	0.0	0.0	0.0
65599	60.8	-32.0	ALL	DIRN.	SUR	1020	1	0	25.0	10.6	27.1

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	2360	1	18	1.9	-0.1	2073	0	10	0	8.7	1.0
ACA	1012	0	7	2.0	-0.2	984	0	3	0	7.4	0.6
AEA	173	2	27	2.6	0.8	161	0	23	0	9.3	1.8
AEL	374	1	24	1.5	-0.5	385	1	26	0	10.7	0.9
AEY	37	0	0	1.2	0.0	37	0	0	0	7.0	1.8
AFL	352	1	6	2.1	0.5	355	1	6	0	8.4	0.6
AFR	1189	0	14	1.8	0.1	1200	0	15	0	9.6	0.8
AIH	114	3	9	1.9	0.1	111	0	6	0	9.6	1.4
AJM	58	3	7	1.3	-0.5	60	0	3	0	8.7	1.6
AMM	84	4	8	1.5	0.2	81	0	4	0	7.8	0.8
AMX	216	0	4	1.8	-0.1	216	1	7	0	10.7	0.8
ANZ	199	1	7	2.2	-1.3	198	0	6	0	6.6	0.3
AOM	334	1	8	1.6	0.7	346	0	10	0	10.0	1.1
AVA	107	1	3	1.7	0.2	116	0	3	0	8.3	-0.4
AZA	317	1	39	2.5	0.6	303	0	18	0	10.5	1.5
BAL	265	0	21	1.9	-0.6	271	0	20	0	10.1	1.6
BAW	1291	1	19	2.1	-0.3	1249	0	16	0	9.0	0.9
BWA	99	0	13	2.6	2.0	93	0	13	0	12.6	1.4
CDN	618	1	5	1.8	0.5	601	0	3	0	7.5	1.0
CFC	22	0	41	4.3	1.2	27	0	26	0	10.7	-1.2
CFG	493	1	6	1.8	-0.8	498	0	5	0	9.2	1.1
CKT	79	1	6	1.7	0.0	79	1	9	0	8.8	1.5
CLX	295	1	6	1.9	-0.3	290	0	4	0	9.4	0.5
CMM	58	0	14	2.2	-0.3	53	0	9	0	8.6	0.2
COA	908	1	16	2.1	0.2	801	0	14	0	13.2	3.0
CRL	159	1	4	1.6	0.5	157	1	3	0	7.6	1.1
CTB	179	0	1	1.7	-0.9	179	0	2	0	7.6	1.2
CTM	27	4	26	1.1	-0.1	26	0	23	0	7.3	-1.0
CUB	219	1	11	1.8	0.6	221	0	12	0	11.1	2.1
DAL	1448	0	25	2.0	-0.4	1239	0	17	0	9.3	0.9
DBY	319	1	4	1.8	-0.8	321	1	6	0	9.4	1.0
DLH	1946	0	16	1.9	0.0	1823	0	14	0	8.3	0.7
EIN	33	0	3	2.6	0.6	34	0	0	0	8.0	0.5
ELY	121	2	8	1.9	-0.3	119	0	5	0	9.7	0.7
EWW	63	0	14	1.8	0.9	59	0	76	0	8.9	1.3
FDX	484	1	20	1.9	0.3	429	0	11	0	8.8	1.8
FIN	453	0	10	1.8	0.2	408	0	7	0	8.4	0.1
GTI	133	1	23	1.9	-0.1	124	2	21	0	10.7	-0.9
HLF	52	0	21	2.4	-1.2	46	0	15	0	8.5	2.8
IBE	1134	1	28	1.9	0.5	1115	0	27	0	10.7	1.4
ICE	941	1	17	1.9	-0.1	812	0	10	0	7.0	0.2
JKK	172	2	15	1.7	-0.2	156	1	11	0	8.2	1.6
KLM	1847	0	13	1.8	0.0	1775	0	10	0	8.5	0.5
LDA	104	1	27	2.4	-0.4	98	0	22	0	8.5	1.7
LDI	205	10	56	3.8	1.7	201	0	27	0	10.2	0.3
LIB	104	2	12	1.7	0.7	108	1	12	0	10.9	1.3
LOT	106	0	8	2.0	-0.7	100	0	3	0	8.6	-0.7
LTU	437	1	17	2.0	-0.4	390	1	10	0	9.0	1.7
LXR	22	0	27	2.1	0.7	22	0	27	0	8.2	0.4
MAS	59	0	14	2.1	0.1	55	0	16	0	11.6	0.9
MPD	49	0	8	2.4	1.0	48	0	6	0	10.6	1.5
MPH	386	0	8	1.8	-0.4	379	0	7	0	9.7	0.8
NCA	24	0	0	1.6	0.4	24	0	4	0	11.0	0.0
NWA	2722	0	8	2.0	0.7	2607	0	5	0	8.8	0.5
PAC	131	1	15	1.9	0.9	121	1	14	0	11.2	0.6
RAM	55	4	13	2.0	-0.6	55	0	7	0	9.3	2.6
RCH	108	5	17	1.8	0.6	110	0	13	0	11.0	2.8
RJA	46	0	26	2.2	0.0	40	0	13	0	6.9	0.9
RRR	116	0	16	1.7	0.3	113	0	12	0	6.4	2.0

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SAB	55	2	22	1.5	0.1	45	0	13	0	6.8	0.6
SAS	1327	0	2	1.9	-0.1	1324	0	2	0	8.5	0.1
SIA	132	0	5	1.7	-0.9	133	0	7	0	7.1	0.7
SLR	108	0	19	1.5	-0.3	109	0	21	0	10.3	0.4
SVA	93	1	2	1.8	-0.2	98	0	7	0	11.4	0.1
SWR	123	0	12	1.9	-0.5	115	1	8	0	7.8	1.2
TAP	247	0	6	1.6	-0.3	247	0	6	0	9.1	2.5
TOW	78	0	15	1.9	-0.2	73	0	15	0	12.0	1.0
TWA	753	1	20	2.3	0.7	648	1	13	0	9.4	1.4
UAL	1657	0	11	1.9	-0.2	1563	0	7	0	7.4	1.0
UPS	515	0	32	2.2	0.4	470	0	29	0	8.0	1.2
USA	244	1	21	2.2	-0.3	216	0	14	0	8.9	2.2
VIR	283	1	11	2.1	-0.4	277	0	6	0	8.5	0.7
VKG	53	0	2	1.8	0.3	54	0	0	0	6.4	0.4
WOA	54	0	11	1.9	0.5	51	0	8	0	7.5	1.9
BA	5339	1	3	1.7	0.2	5338	0	1	0	7.1	1.0
KL	2503	0	1	1.9	1.2	2503	0	0	0	7.0	0.3
LH	344	0	0	1.6	0.8	344	0	0	0	5.9	0.5
I	20	0	5	1.9	-1.6	20	0	5	0	5.5	1.6
N	371	0	11	2.7	0.4	363	0	7	0	9.7	0.6
ADS	119	0	0	1.3	-0.4	119	0	0	0	7.5	1.6
US ACARS	12510	0	3	1.7	0.5	12508	0	2	0	7.2	0.8

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :100 hPa.

Element monitored :GEOPOTENTIAL HEIGHT in metres

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	1	0	0.0	19.0	19.0
DBBH	12	Z	100	4	0	7.0	17.0	15.5
ELM/7	00	Z	100	1	0	0.0	36.0	36.0
ELML7	00	Z	100	18	0	16.0	17.4	6.9
ELML7	12	Z	100	14	0	16.8	26.6	20.6
FNOR	00	Z	100	14	0	67.6	68.4	-10.1
FNOR	12	Z	100	15	0	16.9	30.0	24.7
FNOU	00	Z	100	18	0	8.2	12.4	9.3
FNOU	12	Z	100	16	0	11.1	19.7	16.3
FNPH	00	Z	100	11	0	13.8	14.3	4.0
FNPH	12	Z	100	13	0	12.6	16.1	10.0
FNRS	00	Z	100	8	0	11.9	12.0	1.4
FNRS	12	Z	100	5	0	8.7	10.6	6.0
JBOA	00	Z	100	1	0	0.0	7.0	-7.0
JCCX	00	Z	100	1	0	0.0	44.0	44.0
JDWX	00	Z	100	1	0	0.0	45.0	45.0
JGQH	00	Z	100	1	0	0.0	16.0	16.0
LDWR	00	Z	100	27	0	15.0	17.4	-8.9
LDWR	12	Z	100	29	0	11.5	12.1	-3.9
OVYA2	00	Z	100	13	0	19.2	26.6	-18.5
OVYA2	12	Z	100	14	0	22.9	24.5	-8.6
OXYH2	00	Z	100	23	0	20.8	31.1	-23.2
OXYH2	12	Z	100	17	0	13.0	26.1	-22.7
RAN	00	Z	100	1	0	0.0	76.0	76.0
V2XM	00	Z	100	6	0	18.7	18.8	2.7
V2XM	12	Z	100	8	0	6.9	7.8	3.6
XXBA	00	Z	100	1	0	0.0	87.0	87.0
03953	00	Z	100	26	0	12.5	12.5	-0.6
03953	12	Z	100	28	0	13.6	13.6	0.9
04018	00	Z	100	28	0	15.5	15.6	1.8
04018	12	Z	100	26	0	17.7	17.8	-0.7
04220	00	Z	100	6	0	8.8	17.4	15.0
04220	12	Z	100	9	0	12.0	16.5	11.4
04270	00	Z	100	27	0	14.5	16.7	-8.4
04270	12	Z	100	30	0	14.9	15.2	-3.0
04339	00	Z	100	20	0	11.0	13.1	7.0
04339	12	Z	100	22	0	19.9	20.7	5.9
04360	00	Z	100	29	0	11.1	11.5	3.1
04360	12	Z	100	28	0	16.3	16.4	-2.1
08001	00	Z	100	28	0	13.7	14.0	2.9
08001	12	Z	100	27	0	17.2	21.9	13.5
08508	12	Z	100	16	0	20.8	20.9	-2.3
08594	00	Z	100	1	0	0.0	12.0	12.0
08594	12	Z	100	15	0	11.1	28.7	26.5
60020	00	Z	100	19	0	9.7	10.8	4.7
60020	12	Z	100	18	0	11.0	11.8	4.2
71600	00	Z	100	29	0	15.7	24.9	19.3
71600	12	Z	100	30	0	14.0	17.8	10.9
72201	00	Z	100	28	0	17.3	18.7	7.2
72201	12	Z	100	28	0	25.4	25.8	4.5
72402	00	Z	100	24	0	15.3	17.0	7.5
72402	12	Z	100	26	0	15.6	22.8	16.6
74494	00	Z	100	14	0	14.2	14.5	2.6
74494	12	Z	100	23	0	10.9	13.8	-8.4
78016	00	Z	100	27	0	14.2	25.1	20.8
78016	12	Z	100	27	0	19.0	30.1	23.4

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	500	1	0	0.0	0.0	0.0
DBBH	12	Z	500	4	0	6.0	28.4	27.8
ELM/7	00	Z	500	1	0	0.0	30.0	30.0
ELML7	00	Z	500	18	0	11.0	17.7	13.8
ELML7	12	Z	500	15	0	19.5	27.5	19.5
FNOR	00	Z	500	15	0	10.4	23.1	20.7
FNOR	12	Z	500	17	0	10.3	24.6	22.4
FNOU	00	Z	500	18	0	8.4	17.7	15.6
FNOU	12	Z	500	17	0	8.7	22.4	20.6
FNPH	00	Z	500	11	0	12.7	17.1	11.5
FNPH	12	Z	500	13	0	10.8	16.9	13.1
FNRS	00	Z	500	8	0	6.2	14.0	12.5
FNRS	12	Z	500	6	0	10.3	16.2	12.5
JBOA	00	Z	500	1	0	0.0	8.0	8.0
JCCX	00	Z	500	1	0	0.0	5.0	5.0
JDWX	00	Z	500	1	0	0.0	5.0	-5.0
JGQH	00	Z	500	1	0	0.0	20.0	20.0
JIVB	00	Z	500	1	0	0.0	12.0	12.0
LDWR	00	Z	500	29	0	10.1	10.4	2.6
LDWR	12	Z	500	29	0	9.1	9.2	1.3
OVYA2	00	Z	500	13	0	15.0	22.0	-16.1
OVYA2	12	Z	500	14	0	21.4	24.3	-11.6
OXYH2	00	Z	500	24	0	14.0	26.0	-22.0
OXYH2	12	Z	500	18	0	13.6	25.4	-21.4
RAN	00	Z	500	1	0	0.0	80.0	80.0
SHIP	00	Z	500	1	0	0.0	84.0	84.0
V2XM	00	Z	500	8	0	11.7	11.7	-0.6
V2XM	12	Z	500	8	0	24.0	25.2	7.8
XXBA	00	Z	500	1	0	0.0	5.0	5.0
03953	00	Z	500	29	0	9.3	14.1	10.6
03953	12	Z	500	30	0	12.0	13.4	6.1
04018	00	Z	500	30	0	15.0	17.0	7.9
04018	12	Z	500	30	0	13.7	15.9	8.1
04220	00	Z	500	30	0	11.4	13.6	7.4
04220	12	Z	500	29	0	9.1	9.3	2.0
04270	00	Z	500	30	0	15.3	15.3	0.2
04270	12	Z	500	30	0	13.4	13.7	-2.6
04339	00	Z	500	27	0	13.3	15.4	7.8
04339	12	Z	500	28	0	14.8	16.7	7.8
04360	00	Z	500	30	0	15.4	15.7	3.0
04360	12	Z	500	29	0	14.3	14.9	-4.4
08001	00	Z	500	30	0	12.6	17.8	12.6
08001	12	Z	500	30	0	11.2	19.8	16.3
08508	00	Z	500	1	0	0.0	18.0	18.0
08508	12	Z	500	28	1	14.0	21.0	15.6
08594	00	Z	500	1	0	0.0	13.0	13.0
08594	12	Z	500	20	0	7.2	21.2	20.0
60020	00	Z	500	27	0	8.5	17.8	15.7
60020	12	Z	500	29	0	8.9	25.7	24.1
71600	00	Z	500	29	0	15.3	15.7	3.6
71600	12	Z	500	30	0	11.5	11.5	1.0
72201	00	Z	500	29	0	7.0	16.4	14.8
72201	12	Z	500	28	0	8.2	11.9	8.5
72402	00	Z	500	28	0	14.0	14.1	1.6
72402	12	Z	500	27	0	9.7	10.2	3.0
74494	00	Z	500	28	0	9.0	10.8	6.0
74494	12	Z	500	29	0	8.3	8.8	3.0
78016	00	Z	500	27	0	9.2	28.9	27.4
78016	12	Z	500	27	0	9.7	26.6	24.7

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix 1.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	1	0	0	0.0	-2.3	-1.0
DBBH	12	V	100	4	0	0	0.0	1.0	-0.7
ELM/7	00	V	100	1	0	0	0.0	-5.0	6.2
ELML7	00	V	100	14	0	0	0.0	-0.4	1.9
ELML7	12	V	100	13	0	0	4.0	0.3	1.6
FNOR	00	V	100	12	0	0	3.6	1.7	1.3
FNOR	12	V	100	15	0	0	2.7	-0.3	0.8
FNOU	00	V	100	18	0	0	2.5	-1.7	-0.4
FNOU	12	V	100	16	0	0	3.2	0.4	-1.0
FNPH	00	V	100	11	0	0	3.5	-0.1	0.5
FNPH	12	V	100	13	0	0	5.0	-0.1	1.4
FNRS	00	V	100	6	0	0	3.9	0.1	0.1
FNRS	12	V	100	5	0	0	3.9	-2.1	0.7
JBOA	00	V	100	1	0	0	3.9	3.5	-1.6
JCCX	00	V	100	1	0	0	3.9	-3.4	0.2
JDWX	00	V	100	1	0	0	3.9	1.6	5.7
JGQH	00	V	100	1	0	0	3.9	-0.6	-1.8
LDWR	00	V	100	27	0	0	3.9	0.3	-0.1
LDWR	12	V	100	29	0	0	2.2	0.7	0.2
OVYA2	00	V	100	12	0	0	2.5	-0.4	-0.9
OVYA2	12	V	100	14	0	0	3.3	-0.2	-0.5
OXYH2	00	V	100	20	0	0	2.4	-0.7	1.2
OXYH2	12	V	100	15	0	6	3.4	-2.4	0.9
RAN	00	V	100	1	0	0	4.9	-0.9	3.9
V2XM	00	V	100	3	0	0	4.9	2.9	-1.3
V2XM	12	V	100	7	0	0	4.9	-0.7	1.6
03953	00	V	100	24	0	0	5.7	-0.3	0.7
03953	12	V	100	28	0	0	3.6	-1.7	-0.1
04018	00	V	100	22	0	0	3.3	-0.4	0.8
04018	12	V	100	13	0	0	3.9	1.2	1.2
04220	00	V	100	3	0	0	3.1	-0.2	1.6
04220	12	V	100	8	0	0	3.1	0.1	1.8
04270	00	V	100	27	0	0	3.1	-0.4	1.1
04270	12	V	100	26	0	0	3.0	-0.8	1.2
04339	00	V	100	17	0	0	3.8	-1.0	-1.3
04339	12	V	100	22	0	0	3.7	2.0	-1.1
04360	00	V	100	24	0	0	4.4	-2.0	1.0
04360	12	V	100	25	0	0	3.6	-0.3	-0.5
08001	00	V	100	22	0	0	4.5	1.2	0.6
08001	12	V	100	20	0	0	3.2	-0.2	-0.9
08508	12	V	100	12	0	0	3.5	0.7	-0.7
08594	12	V	100	10	0	0	3.2	-0.5	5.3
71600	00	V	100	28	0	0	4.1	0.5	-0.3
71600	12	V	100	28	0	0	3.3	0.3	1.7
72201	00	V	100	28	0	0	2.6	0.9	0.3
72201	12	V	100	28	0	0	3.2	0.1	-0.2
72402	00	V	100	24	0	0	3.1	0.7	2.0
72402	12	V	100	26	0	0	3.6	0.8	1.1
74494	00	V	100	14	0	0	3.4	-0.1	1.9
74494	12	V	100	22	0	0	2.8	-1.0	2.3
78016	00	V	100	27	0	0	3.2	-0.8	0.6
78016	12	V	100	27	0	0	3.3	0.6	0.6

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: November 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in $m\ s^{-1}$
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	500	1	0	0	0.0	-0.9	-2.3
DBBH	12	V	500	4	0	0	0.0	0.8	-2.8
ELM/7	00	V	500	1	0	0	0.0	-4.9	-3.9
ELML7	00	V	500	17	0	5	0.0	0.9	-0.8
ELML7	12	V	500	14	0	0	5.7	2.1	0.3
FNOR	00	V	500	15	0	6	3.6	-2.0	-0.3
FNOR	12	V	500	15	0	0	3.2	-0.1	-1.6
FNOU	00	V	500	17	0	0	3.5	-1.0	0.6
FNOU	12	V	500	15	0	0	4.3	-0.3	-0.2
FNPH	00	V	500	10	0	0	2.8	-1.1	-0.7
FNPH	12	V	500	12	0	0	2.0	-0.6	-0.2
FNRS	00	V	500	6	0	0	2.9	0.2	-2.0
FNRS	12	V	500	5	0	0	2.9	-0.5	0.2
JBOA	00	V	500	1	0	0	2.9	-0.6	-0.4
JCCX	00	V	500	1	0	0	2.9	2.4	5.3
JDWX	00	V	500	1	0	0	2.9	1.0	1.5
JGQH	00	V	500	1	0	0	2.9	-2.0	0.5
JIVB	00	V	500	1	0	0	2.9	1.5	1.9
LDWR	00	V	500	29	0	3	2.9	0.1	0.3
LDWR	12	V	500	29	0	0	3.0	-0.7	0.4
OVYA2	00	V	500	13	0	0	3.5	1.4	1.4
OVYA2	12	V	500	14	0	0	4.4	-0.2	-0.3
OXYH2	00	V	500	24	0	4	4.1	-1.6	0.9
OXYH2	12	V	500	17	0	0	4.2	0.4	0.8
RAN	00	V	500	1	0	0	5.6	3.9	-1.6
V2XM	00	V	500	5	0	0	5.6	-1.2	-1.4
V2XM	12	V	500	8	0	0	5.6	1.5	-0.6
03953	00	V	500	29	0	0	4.0	0.9	-0.3
03953	12	V	500	30	0	0	4.3	1.6	-0.6
04018	00	V	500	28	0	3	4.0	1.6	-0.2
04018	12	V	500	29	0	0	5.6	0.1	0.3
04220	00	V	500	29	0	3	3.8	-1.1	0.6
04220	12	V	500	27	0	3	5.2	-0.3	-1.3
04270	00	V	500	28	0	0	3.4	0.7	0.9
04270	12	V	500	29	0	0	3.9	-0.1	0.8
04339	00	V	500	23	0	8	8.0	-0.5	-1.8
04339	12	V	500	28	0	3	6.4	0.2	-0.8
04360	00	V	500	28	0	0	5.5	0.4	0.2
04360	12	V	500	26	0	3	4.5	-1.6	1.3
08001	00	V	500	24	0	0	3.7	0.3	0.7
08001	12	V	500	24	0	0	4.1	0.6	0.0
08508	00	V	500	1	0	0	3.1	-0.6	4.4
08508	12	V	500	24	0	0	3.1	-1.1	0.0
08594	12	V	500	17	0	5	3.4	-2.0	0.0
60020	00	V	500	6	0	0	3.5	-2.0	-1.0
60020	12	V	500	10	0	0	3.5	-2.5	-1.3
71600	00	V	500	29	0	0	3.7	0.3	0.5
71600	12	V	500	30	0	0	4.1	1.3	0.1
72201	00	V	500	29	0	0	3.4	0.8	-1.1
72201	12	V	500	28	0	0	3.0	-0.4	-0.9
72402	00	V	500	28	0	0	2.7	0.3	0.7
72402	12	V	500	27	0	0	2.7	1.8	0.9
74494	00	V	500	28	0	0	2.6	0.5	2.0
74494	12	V	500	29	0	0	3.2	-0.6	0.7
78016	00	V	500	27	0	0	4.0	0.9	0.3
78016	12	V	500	27	0	0	3.2	0.8	0.7

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45